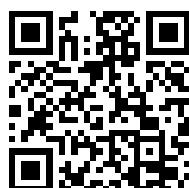

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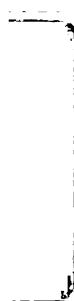
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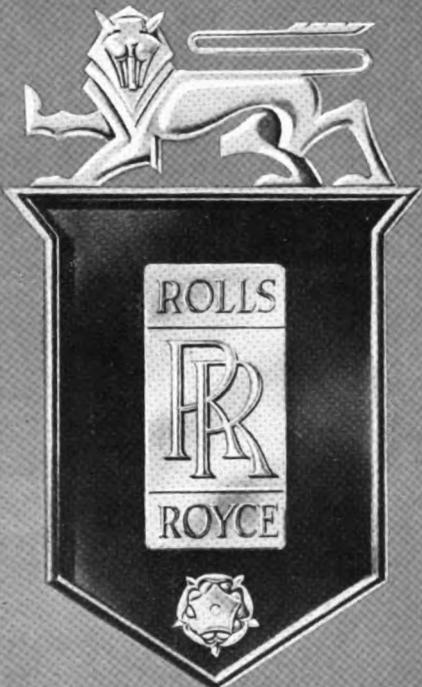


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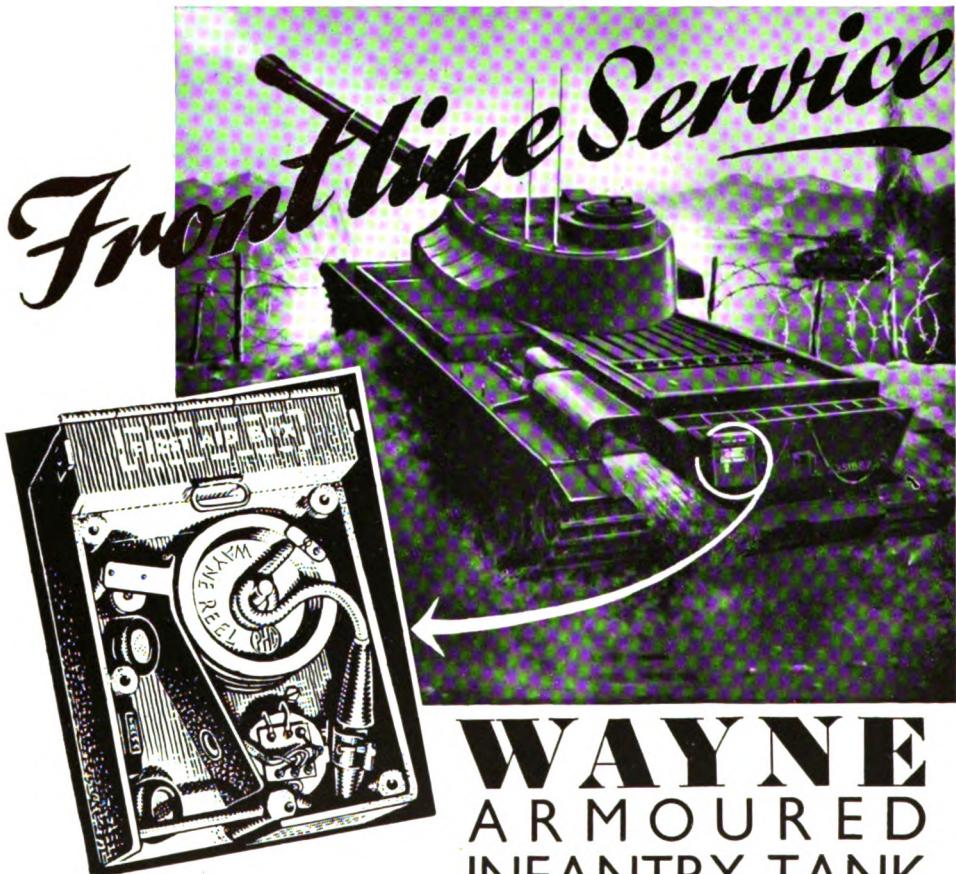
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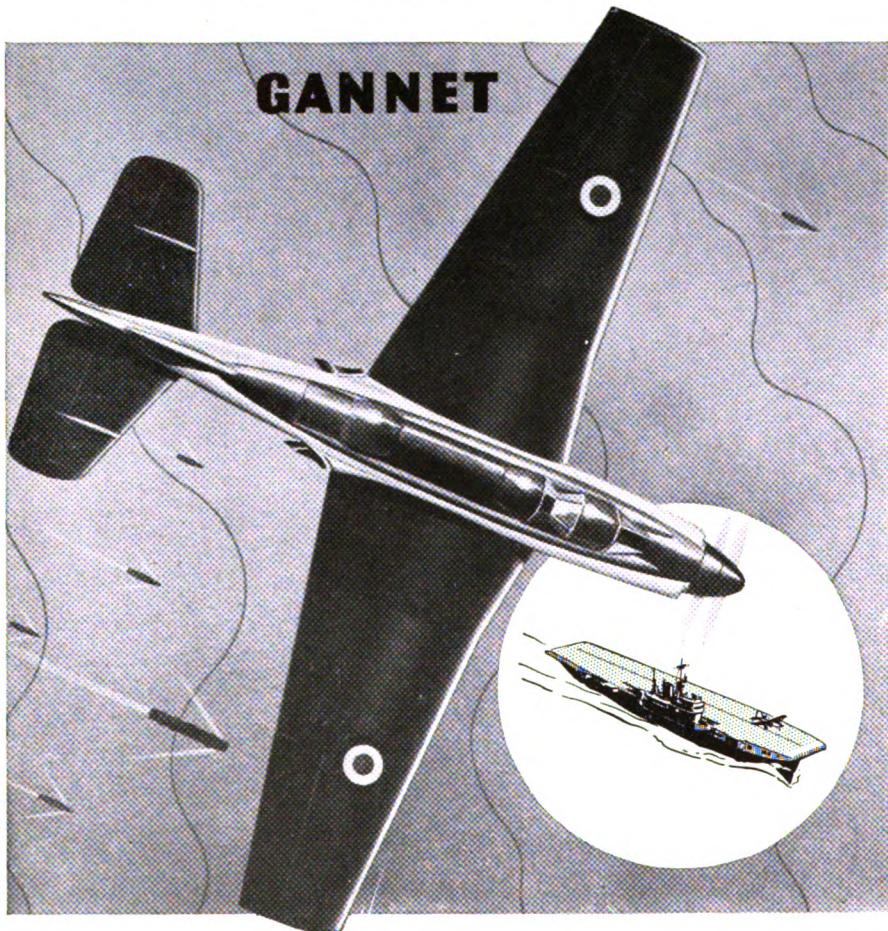
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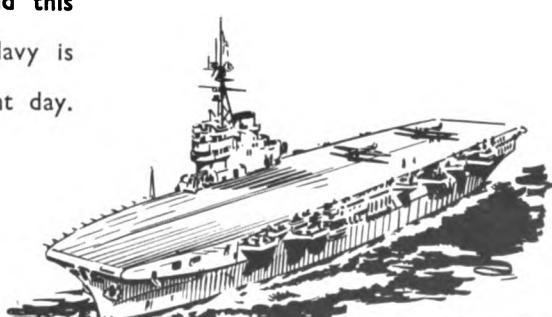
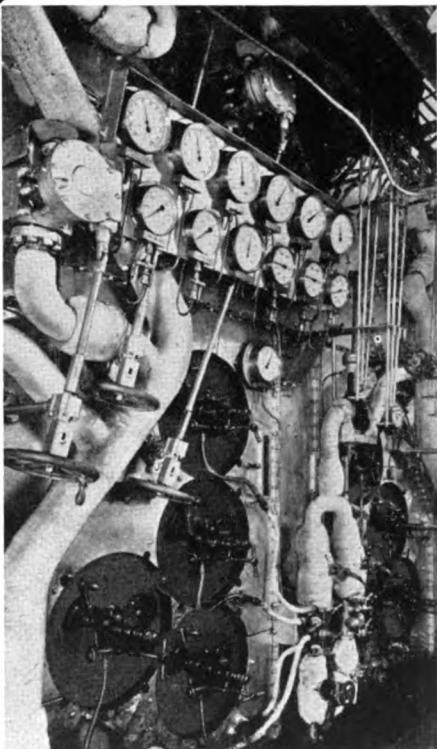


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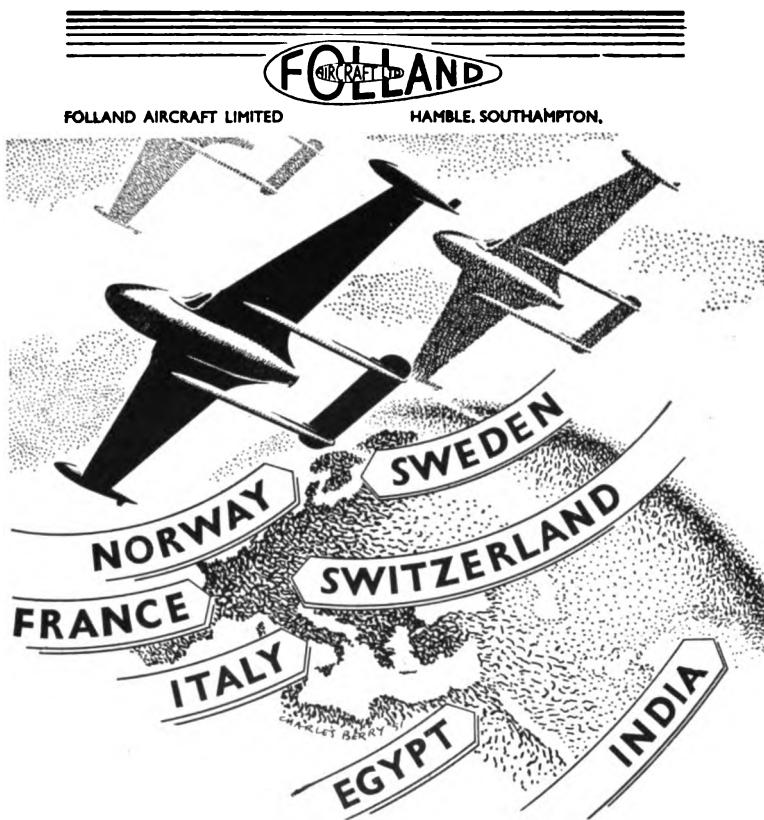


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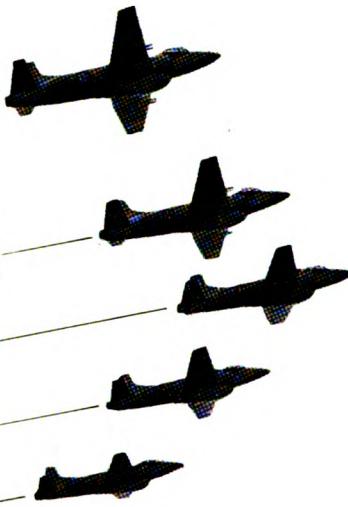
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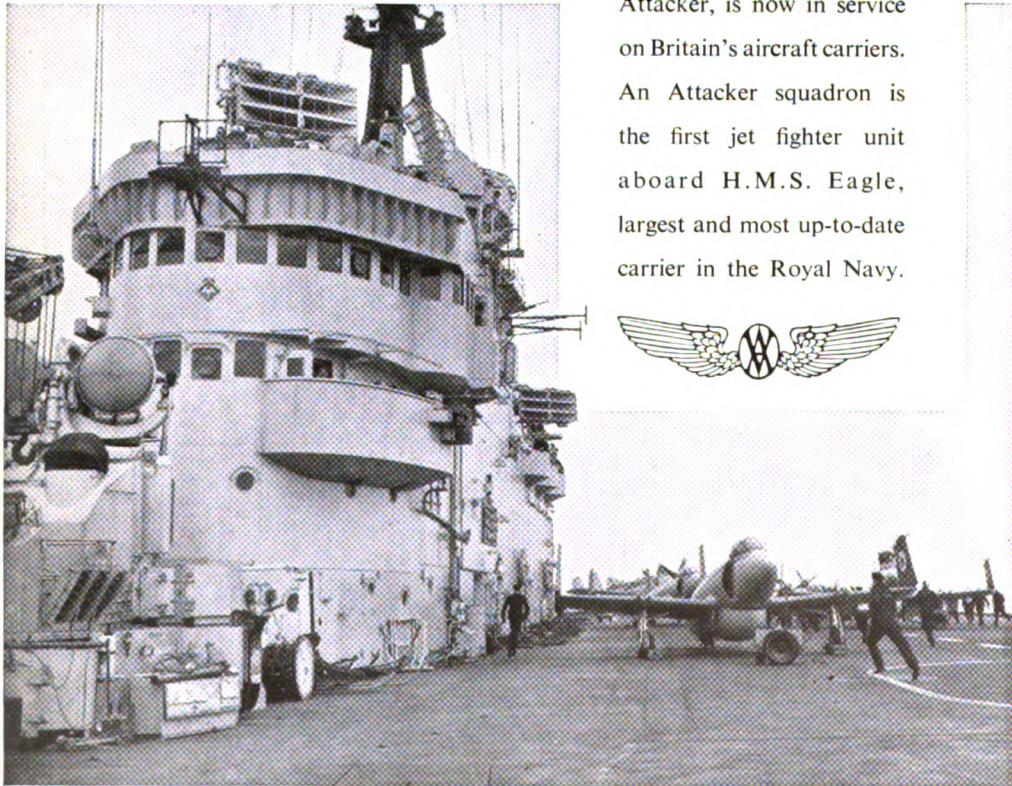
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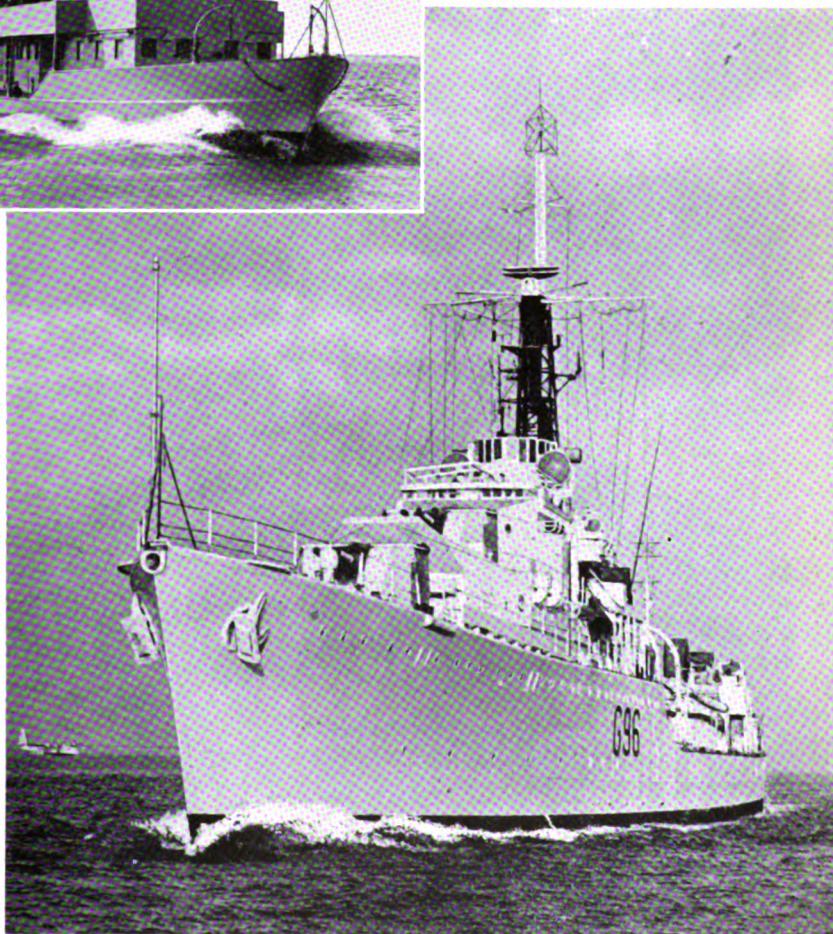
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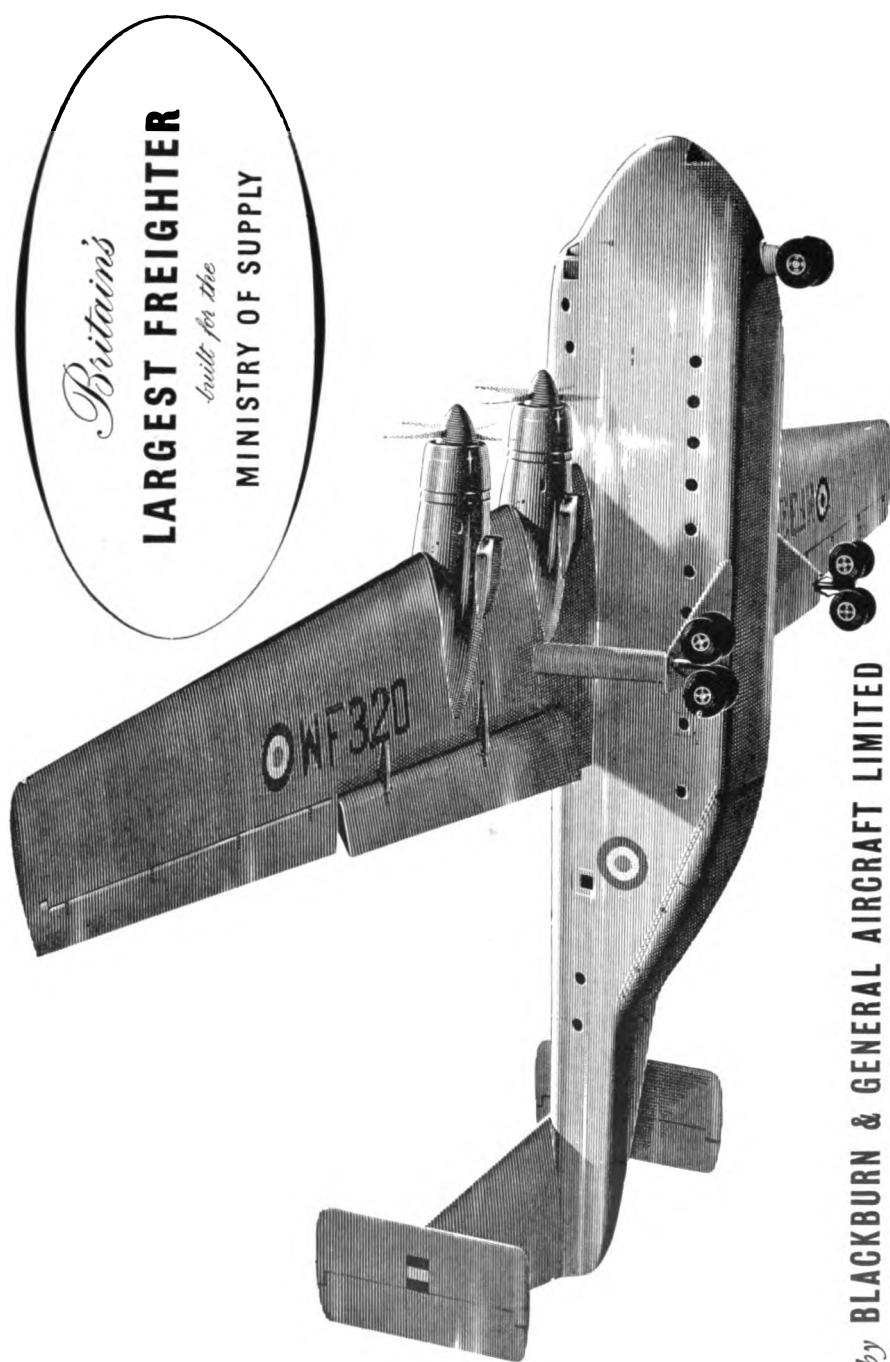


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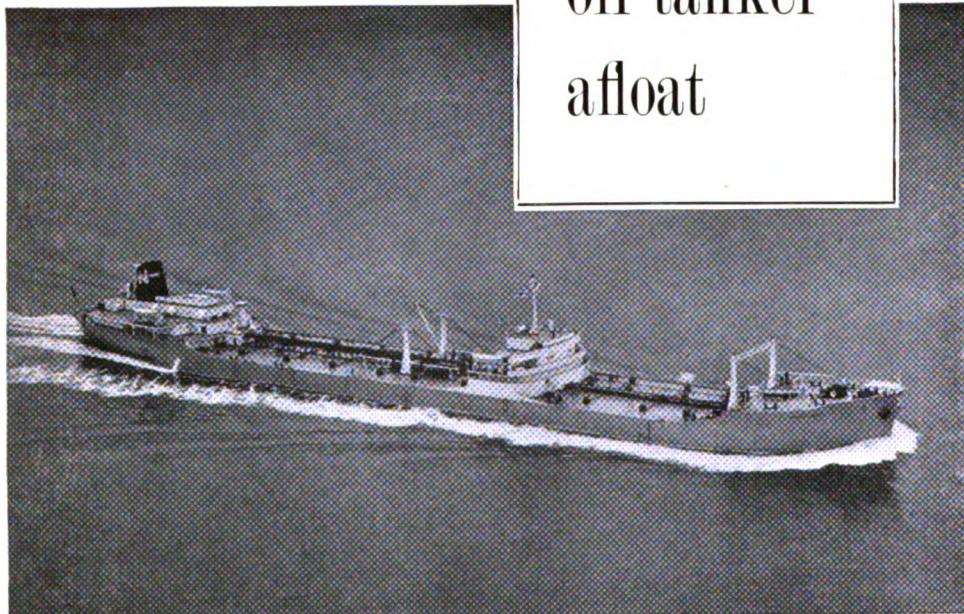
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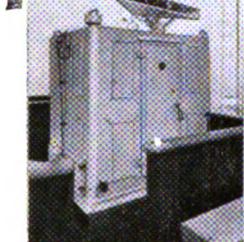
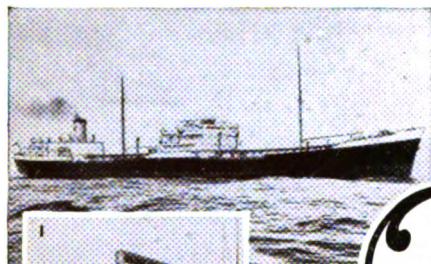
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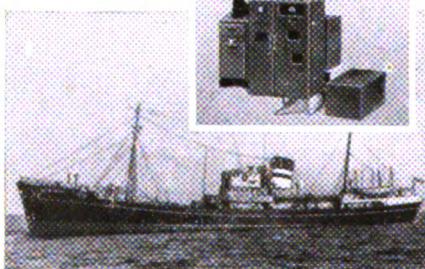
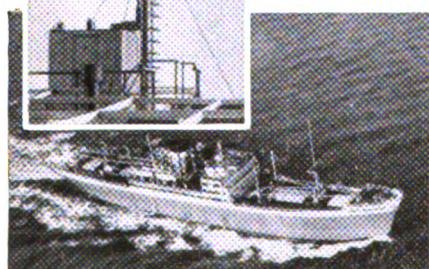
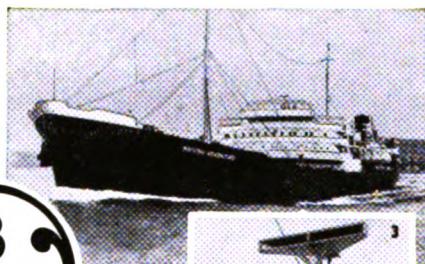
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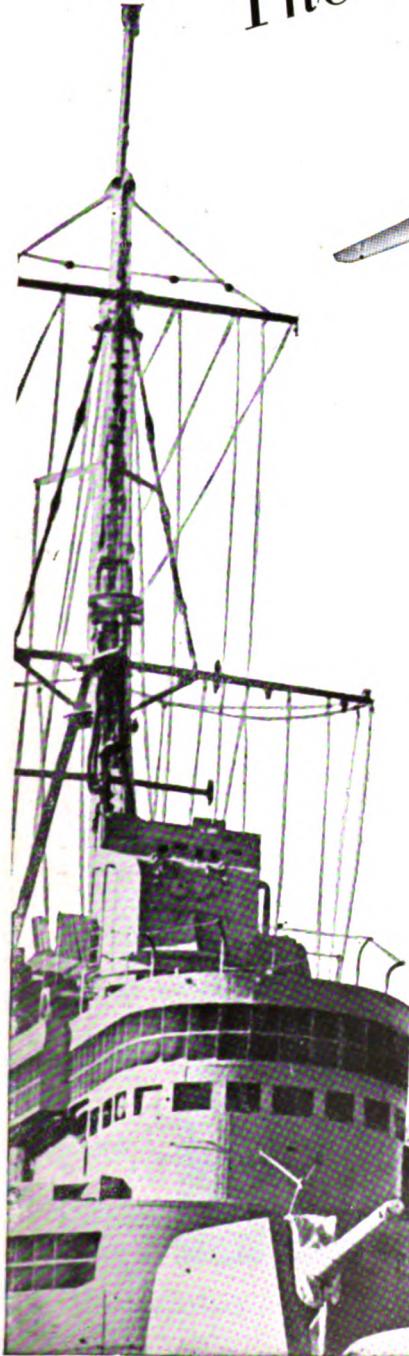
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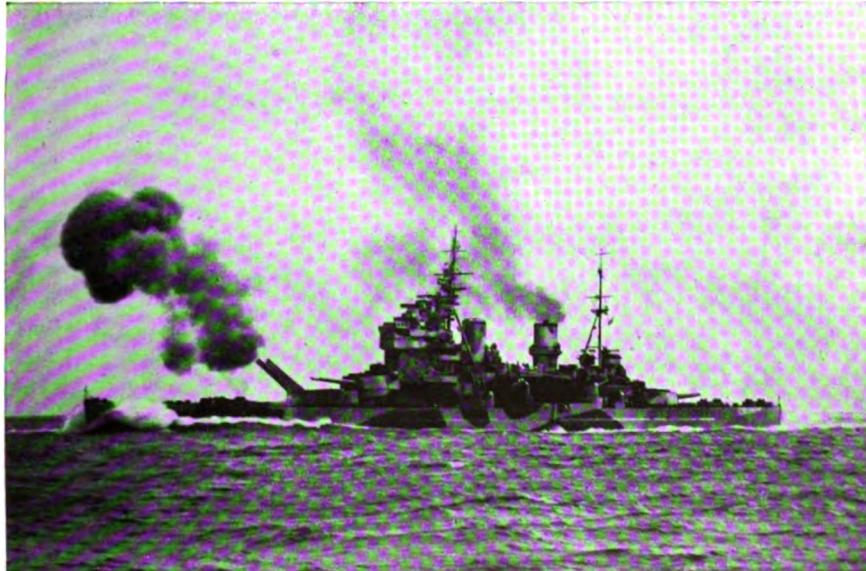
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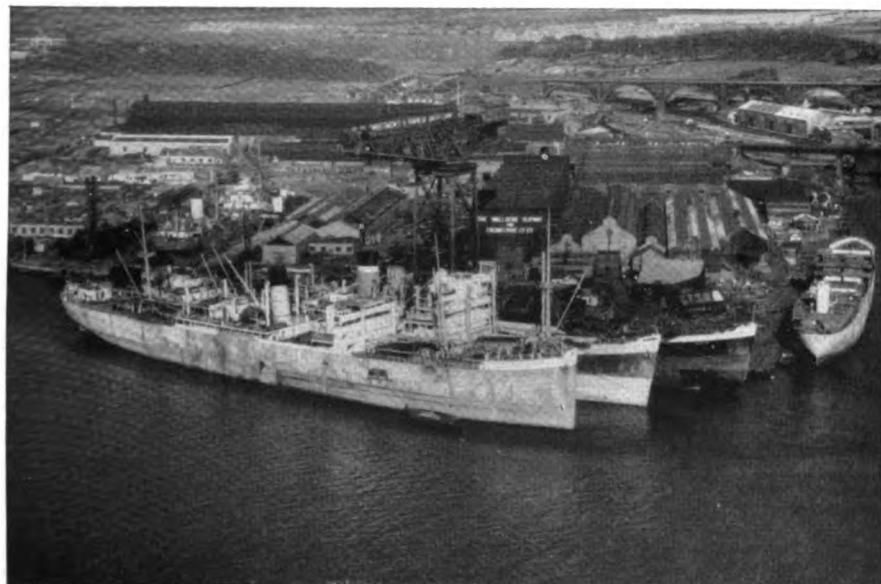
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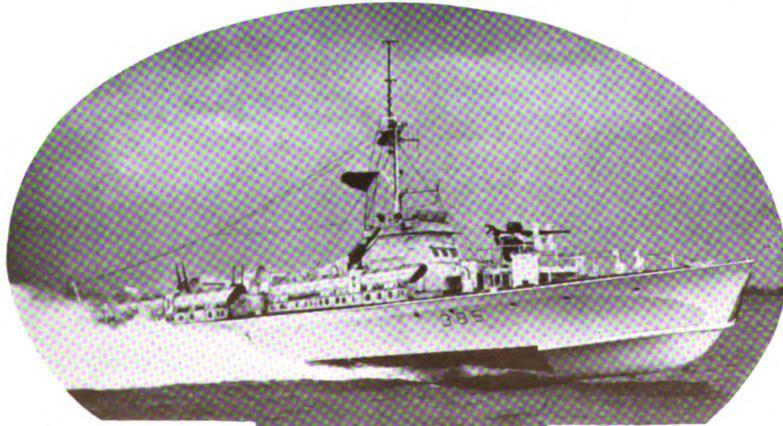
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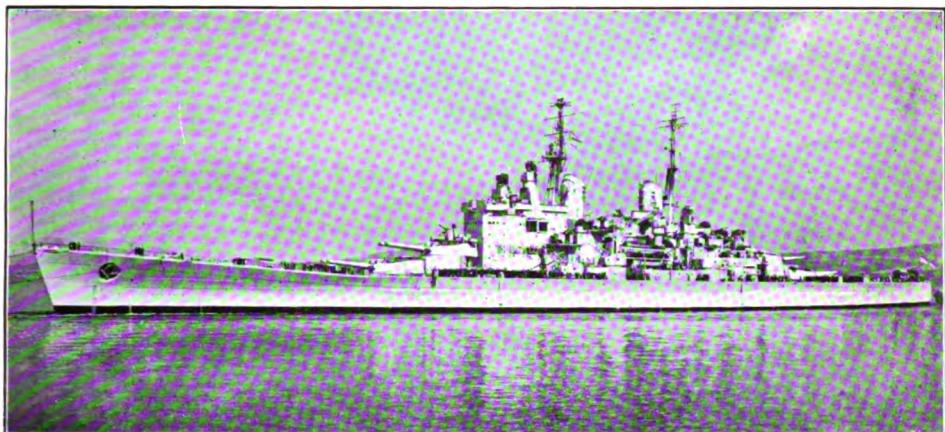


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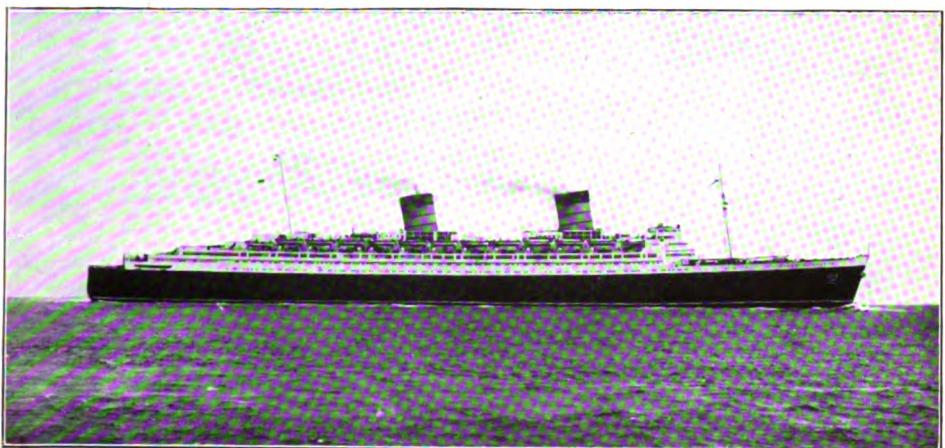
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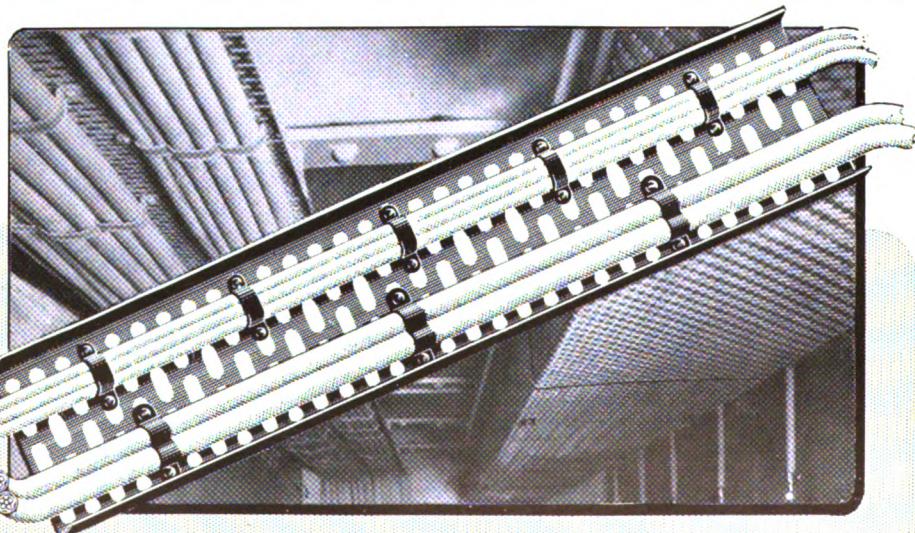
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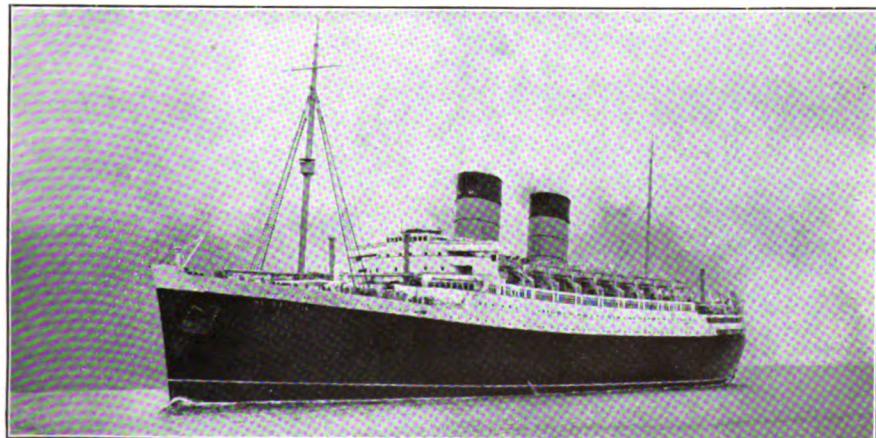
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FOREWORD

THIS year's issue of "Brassey's Annual" is compiled under the shadow of the great loss which the British Armed Forces, in common with the whole nation, have sustained by the sudden death, on February 5, 1952, of His Majesty King George VI. King George VI was not only the titular head of each of the three Services ; he was also a model for every one of the officers who served under him, as every one of them who was privileged, even in small degree, to come into contact with him well recognised. No man had a higher sense of duty than he, or ever spared himself less in the performance of duty. He was ever mindful of the welfare of his subjects, and earned their respect, their loyalty, their confidence and their love. The Editors of "Brassey's Annual" would wish to tender to Her Majesty Queen Elizabeth II their respectful sympathy on the loss of a great King and a beloved father, and their loyal homage to their new Sovereign.

H. G. T.
C. N. B.
W. M. Y.

P R E F A C E

As "Brassey's Annual" goes to press in 1952, necessarily some months before the date of publication, there is little change in the actual military situation in any part of the world. The war in Korea goes on, as do the seemingly interminable discussions directed towards arrangement of terms for an armistice. In Indo-China and Malaya, Communist-supported guerillas continue their efforts, by sabotage and terrorism, to disrupt the normal economic development of those countries and to make their pacification and economic recovery impossible. But the Communists are losing ground in South-east Asia; and in Korea the military situation appears to be one of stalemate. On the other hand, in the rest of the world the position and defensive potentialities of the anti-Communist nations have steadily improved. It is no simple process to weld the forces of some ten nations into a single defensive entity; yet the progress made towards that goal under the North Atlantic Treaty has been steady and solid, as is illustrated in more than one chapter in this volume. That, together with the progress in rearment and re-equipment of the Armed Forces of the Western Nations, has so far lessened the gap between their defences and the power of aggression inherent in the level of armaments maintained by the Communist powers and their satellites, as to provide a greatly increased deterrent to Soviet attack on the West. Indeed, it now seems probable that those who direct the Communist actions throughout the world, rather than launch the open attack which not very long ago seemed imminent, will continue to employ the method of "War by Proxy" so ably analysed by Mr. Jules Menken in Chapter IV of this volume.

This issue, following the pattern adopted in the last three years, is divided into a General Section, dealing with the higher direction of Defence and with subjects related to all three of the Armed Forces, followed by a three Sections, each devoted to one Service. It should be noted that Chapter X, which by its title—"The Future of the Aircraft Carrier"—would appear to be wholly concerned with the Navy, is placed in the General Section because it contains suggestions which affect both the other Services as well. In connection with those suggestions, it seems desirable to place again on record that the inclusion of articles by individual authors in "Brassey's Annual" does not necessarily imply that the Editors endorse either the views put forward by those authors, or their interpretation of historical facts. It is the editorial policy of "Brassey's Annual" to ensure, as far as possible, that facts and figures included in it are reliable and, as far as may be possible, complete; but the opinions and theories expressed are those of individual authors.

The Editor has again enjoyed the collaboration of the same able helpers who joined the editorial staff in 1950 when the scope of the Annual was enlarged to cover all three Armed Forces instead of, as up to that date, the affairs of the Navy alone. Brigadier C. N. Barclay has dealt with Army matters, and Air Vice-Marshal W. M. Yool, in spite of the other responsibilities he has assumed since last year's issue was produced, has continued to take charge of the Air Force section.

H. G. T.

CHAPTER I

THE MAKING OF AN OFFICER

THERE ARE few subjects upon which there has been so much discussion, inspired only too often of late years by political partisanship, than the methods of selecting officers for the Armed Forces and the sources from which they should be drawn. That there should be discussion is in no way surprising, even amongst those who are entirely free from any political motive in the matter and are inspired solely by devotion to the Service of which they are members, and the desire that its officers should be the best with whom it is possible to provide it; for many people, not confined to the officer ranks of the Services, have strong opinions and theories about the education of youth, even if they have no actual experience of it beyond vague recollections of their own school days. Thus it is that the system of officer entry and training has for many years been subject to a constant process of tinkering which, indeed, is still going on.

Nor is it surprising that there should have been a certain amount of political prejudice inspiring from time to time attacks on the system in force. Until comparatively recently, though the system of obtaining commissions in the Army by purchase and of entering the Navy as an officer through the personal favour of a captain or admiral had long passed away, and entry was nominally by competitive examination open to all, actually no boy had a chance of entry unless his parents were in a position to give him an expensive education, to pay for an expensive outfit—a very heavy item, this, in the last century—and to supplement his meagre Service pay, for a time at least, by some allowance. This meant that, with the exception of the few who rose from the lower deck or the ranks by conspicuous merit or gallantry in action, the officers of the Navy and Army—the Royal Air Force came into existence only in 1917—were drawn exclusively from the well-to-do classes. The officers' mess came to be regarded, by the sea-lawyer and in the political field by the left-wing agitator, as the stronghold of privilege.

There was, in fact, far less justification for that generalisation than many of those who so regarded the existing system maintained—and possibly sincerely believed. There were, it is true, certain regiments in which it was impossible for a young officer to take a commission unless he was in possession of a substantial private income to cover his share of the joint activities in which his brother officers engaged as a matter of course, and to enable him to live on the social scale which had become regimentally traditional. But there were plenty of opportunities—such as the Indian Army provided, for instance—for service in pleasant places open to the young Army officer, once he was commissioned, without private means; and in the Navy towards the end of the nineteenth century, there were probably to be found in any typical wardroom more officers who had no resources beyond their pay than who had any private means at all. Thus it was that families in which there was a tradition of commissioned service in the Navy or Army were able to maintain it; for the retired officer, living on an exiguous pension or scanty savings, could generally by strict

self-denial manage to foot the bill for his son's entry as an officer into the Service, corps or regiment in which he had himself spent his active career, knowing that it would then be possible for the youngster to support himself and, if he had it in him, to rise to high rank. There was little "privilege", in the sense in which the term is used by the demagogue, in the life of such officers, though the officers' mess, naturally enough, provided substantially more amenity and less discomfort than the ranks or the lower deck; and there was no complaint from the latter that it should do so. Moreover, the officers who came from naval or military families tended to be the best officers, having a family tradition to maintain in making themselves so, to reinforce the pride in their profession which is a common attribute of all men.

The old system, that is to say, though it undoubtedly drew its material from a much restricted sphere, did on the whole produce what the Services needed. That consideration seems to point to the conclusion that if, for other reasons, it should become necessary to change the system, care should be taken to preserve those features of the old one which were responsible for producing results that were good, adding to them only such modifications as were clearly going to produce improvement. For the moment, however, that conclusion is premature. Improvement is always to be sought, and the modifications in the system of the entry and training of officers which have been so frequently made in the past, and which are likely to be made with comparable if not equal frequency in the future, have generally been inspired by the intention, at least, of producing better officers.

There are many examples which justify this generalisation. It is admitted that, half a century ago, practically no young man could hope to become an officer of the Services whose parents had not been able to give him an expensive education—a limitation which meant that the officers of the Services were drawn from a proportion of the population which did not exceed some 10 per cent. of the whole, defined not by ability but by wealth. That limitation was a source of concern to many thinking people who were far removed from any suspicion of demagogery or political prejudice. To them, starting from the premise that the Services need for their officers the best that it is possible to get, it seemed unwise and undesirable that the sources should be thus arbitrarily limited. The Services should be able, it was argued, to enter as their officers the best candidates wherever they were to be found, regardless of the financial resources of the candidates' parents—an attitude with which, except on grounds of snobbery, it is difficult to disagree.

The political objection to the Britannia-Woolwich-Sandhurst system in force in the Services at the turn of the century, though it purported to be based on the same unexceptionable principle, was really based on envy and prejudice. Privilege is unjust and indefensible, cried the demagogue—a pronouncement with which many who are no demagogues will heartily agree. But they will not agree when he goes on to demand that every vestige of any system which embodies even an element of privilege should be swept away, without regard to any good results which, despite those elements, it has produced. So far from a good education being regarded as an advantage for a candidate for a commission in the Services, the argument continued, it must be given no weight whatever. All officers should be drawn from the ranks and from no other source.

To those who have the real welfare of the Services at heart, it is clear that to argue on these lines, however altruistic and morally desirable it may appear to be at first sight, is to approach the problem from the wrong angle. It is, it is true, wholly in line with the not very admirable principle which underlies so much political theory and social action nowadays, of laying stress on the rights of the common man and entirely ignoring any consideration of corresponding duties, of requiring that no man shall enjoy any advantage that is not open to all, regardless of whether or not others have either earned or deserved it. But to proceed on that principle is clearly not the way to organise the Services so that they shall be best able to perform their primary duty of the defence of their country and of their countrymen. If that is the aim—and surely, from the point of view of the national interest, there can be no other—the solution of the problem must depend upon the answers to two questions: what are the characteristics required of the officer, and how can it be ensured that the officers of the Services shall possess them?

Before proceeding to the examination of these questions it may clarify the problem to observe that the characteristics defined by the answer that is found to the first question may be either innate, or capable of being implanted by proper or well-designed education and training. If the former, the problem is chiefly one of selecting those who possess them; that is no easy task, since qualities which the mature man is found to possess do not always show themselves in youth, as any schoolmaster will confirm. If the latter, then the problem is much easier; for it reduces merely to that of devising courses of education and training for a special purpose. It must not be assumed, however, that the whole problem is capable of being reduced to a simple alternative between the two categories. Such simple generalisations are rarely sound in the practical world. Doctrinaire socialism, particularly in its more extreme manifestations, seems to assert that there are no such things as virtues or abilities which are innate, that any man, whatever his antecedents, environment, or upbringing, is capable of filling efficiently and adequately any position of authority whatever; but few men who do not hold that creed will agree that this assumption is born out by human experience. On the other hand, the contrary assumption, that "officer-like qualities" (to adopt a catchword much in favour at one time in the Services) are all inborn, is equally unsound. I propose, therefore, without further argument to adopt the theory that they fall into both categories, and to proceed on that basis in examining the question of what are the characteristics of the good officer.

It seems pertinent to observe that the problem of how to find its leaders in the social conditions of today is not confined to the Services alone. Lord Beveridge, in a recent broadcast entitled "A Letter to Posterity", pointed out that the "peaceable social revolution" through which the present generation has lived and is living had vastly extended the spheres in which that problem had become urgent. "A yet more important change," he said, referring to present conditions which make the accumulation of personal fortunes impossible, "is in the sources of leadership and of voluntary service of all kinds to the community and to one's fellows. The big houses produced for each locality its accepted leaders"; just as, we have already remarked—if we take "the big houses" as a picturesque synonym for the well-to-do classes—not so very long ago they automatically

produced the officers for the Services. Lord Beveridge went on, in a passage which seems remarkably applicable to the problem of the Services,

Just from where, in our classless collection of men and women, the leadership will come to make us a society with a sense of unity, in service to one another and to the world, I do not know. Leadership can come from anywhere, for it depends on personal qualities which are found in men and women of every parentage. But leadership in itself is not enough; the leadership which Hitler gave to Germans led only to evil. Our leadership in Britain, in so far as it has been good, has depended not only on personal qualities but on tradition. We have somehow to carry on an aristocratic tradition in Britain without the aristocrats. How shall we find the *right* natural leaders in place of the hereditary leaders of the past, for small affairs and for great affairs, for the nation, for the town, for the village? That is a question that many of us are thinking about to-day.

Lord Beveridge thus stated the problem—and he is a good authority to quote, since he has had as great a part as any of his generation in bringing about the conditions under which it has come into existence—but gave no guidance as to how its solution is to be found. The Services cannot adopt his pococurantist attitude, for they have got to provide officers, and for good or ill have got to find a solution. So, indeed, have others. As Mr. Eric James has written in a valuable little book on "Education and Leadership" recently published:

The rejection of an *elite* recruited by birth in the democratic and equalitarian temper of the modern world does not imply that all leadership can be dispensed with. It imposes on us rather a greater obligation to investigate the qualities of good leadership and its recognition by other means, if birth and wealth are no longer to be the criteria of choice. . . . The various changes in society that have made the idea of leadership suspect have at the same time made its existence more than necessary.

Mr. James—who is the High Master of the Manchester Grammar School—was not writing of the Services alone, with which this chapter is concerned; but he has drawn many of the illustrations of his argument from the Services, and as his book contains a masterly analysis of the elements of their problem, I make no apology for drawing my readers' attention to it and to the conclusions therein stated. Those who have spent their lives in one of the Services will recognise how sound those conclusions are.

The qualities required of an officer depend upon the conditions of his time, upon the system of discipline of which he is a part, though not quite to such a great extent as would appear at first sight. A system of discipline suitable to, and indeed designed for, conditions in which the lower deck and the ranks comprised a large element drawn from the criminal classes does not necessarily call for many of the qualities which are indispensable to the officer of today; though it will be recognised that the man who possessed them always made the best officer. But as it is the present day with which we are now concerned, it is not necessary to dwell upon the harsher conditions of the past, and I therefore pass at once to definition of the "officer-like qualities" of today, as they present themselves to the experience of those now or recently serving.

The duty of the officer, whatever his rank, is to be the leader of those placed under his command, in peace as in war. It does not suffice merely to be able to enforce obedience through the power of punishment—though a disciplined Service must always retain some sanction in ultimate support of its officers' orders to their subordinates. The officer must win and

command both the confidence and loyalty of his men. To gain their confidence, the need for certain attributes is obvious—courage and tenacity stand out, as does integrity, for none will give their confidence to one on whom they cannot rely. So, indeed, does a high standard of competence. The officer must know his job, that is to say, and know it better than those under him, whose confidence he would gain.

Loyalty depends to a great extent on confidence, for it is difficult to be loyal to anyone not fully trusted; but the officer who would be sure of the loyalty of his men needs other qualities as well. Sympathy and tact are perhaps the most obvious, and a sense of the duty that an officer owes to his men. It is not only they who owe him allegiance and obedience; it is his duty to have a care for their welfare and well-being, and no officer who neglects that duty, however strong and dominant his personality, will either earn or be accorded the loyalty of his men. A dominant personality, indeed, is an asset to an officer; but it is no substitute for the other, more human and sympathetic qualities enumerated here.

All these, it will be noted, are moral qualities, those which Lord Beveridge described as "personal qualities which are found in men and women of every parentage." They are, indeed, the most spectacular and therefore the most obvious to any superficial examination of the subject, and are often cited as if they were the sole factors in "leadership." But Mr. James points out that it would be much sounder to give the first place to high intelligence. That that characteristic has so often been omitted in discussion of the problem is partly because it is less spectacularly striking, but that is not the whole explanation.

This tendency to overstress the contribution of character, he writes, and to put it in an altogether misleading antithesis to intellect, is also probably characteristic of equalitarian societies. Differences in intellectual capacity are particularly distasteful to the equalitarian, who can with comfort fall back on a vague mystique of character as the principal attribute of such leadership as he will allow, and which he may delude himself is very widely diffused. We must not be taken as depreciating in any way the importance of qualities other than intellectual ones; we are simply emphasizing the fact that whatever attributes are required for effective leadership high mental endowment must be reckoned as one of them.

The importance of a high level of intelligence for officers should surely be self-evident today. The Services, like every other sphere of modern life, have become more and more technical and more and more scientific in their equipment; and even if it is enough for the lower ranks to be capable of operating their own part in the complex equipment of modern war by a sort of rule of thumb, clearly something more is needed in the officer, if he is to command the confidence of those under him as well as their obedience. That something more in the intellectual sphere can be attained only by the man who has reached a high standard in his education, for which in itself intelligence well above the general average is needed.

The practical result of this requirement, during the late war, was that the average officer had to be taken from the top 5 to 10 per cent.—measured by intelligence levels—of the population, and that the whole body of officers, including those who, by common consent, were unfit for any rank above that of subaltern, came from the top 30 per cent. Much as the equalitarian may dislike the idea, that is to say, the hard realities of experience demand that the officers of the Services shall be drawn from a certain

proportion of the population which, in effect, form an *élite*, though an *élite* of intelligence and not, as in the past, of wealth. For as to intelligence, everyone will endorse the dictum of the psychologist and the educationist that it is innate rather than acquired.

On the other hand, few will contest the proposition that intelligence of a moderate standard can be fostered by wise and well-designed education, and even that intellectual equipment of the higher standards can be made capable of being best utilised, and therefore more fruitful, by the same agency. But that ability is inborn there can be no reasonable doubt; and though the ranks of those who have received from the first an expensive education are likely to rate somewhat higher intellectually than those whose schooling has been no more than elementary, the problem of recognising the *élite* is one of selection. Moreover, since all educational developments in this country in recent decades have been in the direction of providing every youngster with the best education by which he is mentally capable of profiting, the advantage in that sphere conferred by family wealth has diminished, and should diminish still further if not disappear altogether. An efficient system of selection—into details of which I shall not enter beyond remarking that it will probably comprise both examinations, written and oral, of the familiar pattern as well as the newer psychological tests of which such extensive use was made during the late war—will reveal the intellectual *élite* from whom officers must be drawn.

But high intelligence, as has been demonstrated, is not all. The attributes of the officer include a number of moral and temperamental qualities already roughly defined. Lord Beveridge seems to assert, in the passage quoted, as if it were not open to argument, that they are the product of tradition, and the aristocratic tradition at that; and, indeed, the unbiased student of history can hardly reach any other conclusion. The aristocratic tradition, indeed, is not all-powerful, for every flock contains black sheep, and just as it cannot make a stupid man able, or a weak man strong, so it cannot produce a leader out of unsuitable material. But there is no doubt that, like the tradition of Service families to which reference was made at the beginning of this article, it did foster a spirit of duty, of *noblesse oblige*, and of conscientious service to the community in many walks of life besides the Services. Mr. James, after an exhaustive analysis informed by the wisdom and experience of a distinguished schoolmaster, in effect reaches the same conclusion. The Public Schools, for long extolled as the nurseries of leadership—whether or not the great Duke of Wellington did actually utter the oft-quoted *cliché* about the playing-fields of Eton—actually drew their material, practically exclusively for many generations, from homes in which the aristocratic tradition (in the sense in which the expression was used by Lord Beveridge) was firmly established. They did, indeed, and do adopt it, whole-heartedly if not explicitly, and they powerfully reinforce it, if only by taking it completely for granted. But it cannot be maintained that it originated in the public schools; it was, originally, born of home influence.

Yet it does not follow that the products of tradition, in the shape of “officer-like qualities”, cannot be implanted even when home tradition is lacking. Indeed, the recent experience of the training of naval cadets, in which a certain number of entries have been reserved for some years past for boys coming from what may for convenience be described as the lower

social strata provided that they showed themselves to be of the prescribed level of ability and intelligence, proves the exact contrary. Mr. James, too, remarks :

It is surely one of the highest functions of the schools to help the child to transcend his social and cultural handicaps, and this is to some extent true of moral shortcomings. . . . We should realize that it is one of the tasks of education to remedy defects of temperament and even character, and not to exclude too rigorously from the start those who possess such shortcomings.

Here, then, is to be found the key to the solution of the problem, so far as the Services are concerned, which Lord Beveridge confessed himself unable to discern. Having picked out from the general body of candidates for commissions those who possess the necessary intellectual powers, it is then necessary to devise a form of further education and training which shall not only develop those powers to the utmost, and to the best advantage in accordance with the needs of the profession of arms ; but shall also implant the tradition—in those who lack it up to the time of their selection—from which spring the moral qualities which are recognised as indispensable to the officer, and foster it to the utmost both in them and in those who have already grown up under its influence. It would be in the highest degree unjustified to maintain that this latter requirement is easy of achievement—very far from it. But its difficulty is no justification for the defeatist attitude of declaring it impossible, as an excuse for accepting standards lower than those defined by the analyses made by minds as acute as those of Lord Beveridge and Mr. James. In seeking to devise the educational system needed, however, it would be as well to bear in mind one striking aphorism of Mr. James's, the cogency of which will be recognised by most of those who have had practical and personal experience of the training of youth.

“ Ultimately, however, it is probable that the most powerful factor in moral education is not exhortation, or religious teaching, or study of certain subjects, but rather the influence of individuals.”

This unexceptional principle has an important bearing upon one question regarding the making of an officer—should it or should it not be an invariable rule that the officer must have served for a period on the lower deck or in the ranks?

The theory that he should has never been accepted, as far as its regular officers are concerned, by the Navy—though, it should be remembered, neither has the contrary proposition, that ascent from the lower deck to the quarterdeck is impossible—or the Royal Air Force ; and to the beginning of the late war it was not accepted in the Army. Conditions were, however, profoundly affected by the introduction of universal military service not long before the outbreak of war, though that innovation did not at first affect the normal system of the entry of officers. But during the war—possibly to some extent through the antecedents, political creed, and influence of the then Minister of National Service—equalitarian theory prevailed and it was enacted that none should be commissioned in the Services who had not served on the lower deck or in the ranks. This applied to the temporary officers who, towards the end of the war, comprised more than nine-tenths of the whole ; but it should be noted that the entry of officers for permanent service in the Navy and Royal Air Force, through

their respective cadet colleges, continued without a break throughout the war though only on the much smaller scale of their peace-time numbers.

The position today is that, broadly speaking, the Services have reverted to their pre-war systems of entry and training of officers—I leave out of account for the moment the difference between the Navy's ordinary and "special" entry, and its system of drawing a certain number of officers from the lower deck—but the Army alone retains, on paper, the requirement, largely abrogated in actual practice, that every officer must have served in the ranks. In the Army the "potential officers" are picked out by the Commanding Officers of their units, the vast majority of them at a very early stage of their Service career, from the young men joining as national-service men or soldiers on regular voluntary engagements; they are there and then segregated, for intensive observation, in a special sub-unit whence nearly all of them—some, of course, fail to make the grade and revert to the ranks—appear before the Regular Commissions Board or become National Service officers. Most of those who become officers through this process, though nominally serving in the ranks until they actually receive their commissions, actually serve no more than a few weeks at the most in the real rank and file. Moreover, it is perfectly well known that before they actually join up many of them are known, recommended, or suggested—unofficially, of course—to their prospective Commanding Officer, who thereby has a very adequate knowledge of their background to help him in selecting "potential officers." The extent to which they have already been under the influence, through the agency of home or school atmosphere, of the tradition whence true leadership is born is thus known to him who has the duty of making the first selection; and the paper regulation that all officers must have served in the ranks, while observed in the letter, is—rightly, as experience teaches—discarded in spirit.

It is, or at least was, a favourite equalitarian argument that the officer could not possibly be qualified to command those placed under his orders unless he had had personal experience of the conditions created by the situation in which one man is placed under the orders—tyranny, the demagogue would call it—of another. This is a modification of the creed that no man is fit to be another's master, but it is not far removed from it; and if it were true it would mean that there could never have been a good officer in the past. Moreover, it springs from ignorance of the actual circumstances of service in the forces, in which, in a sense, there is a greater gulf fixed between, for instance, the midshipman and the captain of his ship than between the midshipman and the crew of the boat which is his first command.

The plain fact is that ordinary service on the lower deck or in the ranks for anything beyond a brief period is not only unnecessary but is actually detrimental to the making of an officer. Insistence on the necessity for such service was born of equalitarian theory, which was actually based upon a social organisation, not confined to the Services but of the nation at large, which is rapidly passing away altogether. But from the point of view of the standard of education indispensable to the officer, it is manifestly a sheer waste of time; and from the point of view of implanting or fostering the moral and temperamental qualities which go to the making of the real officer, it is definitely harmful. The atmosphere of the lower deck or the barrack room is actively inimical to the tradition in which the

“potential officer” must grow up if he is to imbibe the essence of real leadership, though it must be recognised that the exceptional man will succeed in rising above that handicap, and that exceptional channels must be provided—as indeed they are at present in all three Services—whereby he can rise.

At the time of writing, the recent change in the age of entry of naval cadets from 13 to 16—a product, it may be suspected, of equalitarian theory once more, though somewhat watered down—which is understood to be proving far from adequate in practice, is under examination; it may be that it will be modified once more if it is found not to be producing officers in the numbers, and of the standard, that the needs of one of the Armed Forces demand. It is not the only avenue of entry to the Navy, for the 18-year-old “special entry” operates in parallel with it and provides a channel of entry for youths whose general education is complete up to university standard and who may have already grown up in an atmosphere embodying the tradition of “voluntary service of all kinds to the community and to one’s fellows” which Lord Beveridge finds to be a condition precedent of leadership. (The special entry, it may be noted, is closely analogous to the systems in force in the Royal Air Force and—in its present practical form—in the Army.) But if the special entry does not in practice produce the numbers required, the question now to be decided is whether the 16-year-old entry is capable of providing the balance. The 13-year-old entry admittedly did; and, after the scholarship system introduced ten years ago came into force, it was not open to condemnation, or even objection, on the outworn ground that it perpetuated privilege. Whatever the result of the present enquiry, however, it is to be hoped that the action that is taken will be founded upon recognition of the need of the Services to be equal to their task of the defence of the realm, and upon the absolute necessity of providing them with officers of the standard that their merits and their traditions deserve.

It is time that equalitarian theory was swept away altogether from this sphere and that the process of making an officer, in any of the Armed Forces, was placed on a firm basis of common sense and the recognition of realities.

H. G. T.

CHAPTER II

THE SERVICES IN 1951-52

BY THE sudden death of His Majesty King George VI on the night of February 5, 1952, members of the Armed Forces of Great Britain and of the whole Commonwealth suffered the grievous loss of one who was not only their titular chief but their friend. Through his personal experience as a young officer in the Royal Navy and later in the Royal Air Force; by his never-failing interest in all matters pertaining to the efficiency and well-being of the Services; by his courage in affliction; and by his personal example of self-sacrifice and devotion to duty, it may be truly said of His Late Majesty that he inspired in all men and women of the Services a sense of loyalty and devotion far beyond the bounds which his kingship demanded. Well may it be recorded of him that in all things he personified the true and ancient spirit of chivalry, from which all our military virtues descend.

The year 1951-52 has been a period of great strain for the British Armed Forces. Expansion under the three-year programme of rearmament has barely kept pace with the demands for building up strength in Western Europe under N.A.T.O., not only in Regular formations and units, but in the reserves needed to support them in war; for maintaining our contribution to the United Nations Forces fighting in Korea; for combating the communist forces in Malaya; for guarding the Middle East; and for maintaining the numerous bases and garrisons throughout British overseas territories. To add to these burdens, the Royal Navy was called upon to perform a most difficult and delicate task in the Persian Gulf in connection with the safeguarding and evacuation of British employees of the Anglo-Iranian Oil Company, and all three Services have been called upon to play a most exacting and unpleasant role in guarding our Middle East base and keeping open the Suez Canal in the face of civil uprising and organised sabotage.

A measure of the strain imposed upon Service resources may be taken from the position of the strategic Army reserve at home, which by the closing months of 1951 had shrunk to such a dangerously low level that measures were taken to organise and train the personnel of all training establishments, depots, and administrative units into mobile columns, and the necessary steps initiated to raise a proportion of Home Guard units in South-Eastern England. As the Prime Minister stated in the House of Commons on December 6, 1951, these measures were designed to act as a deterrent against "the danger of paratroop descents on a considerable scale." In the meantime a vigorous pruning of the Army's administrative "tail" has made possible the re-forming of seven 2nd battalions of infantry regiments. These, in due course, will help to re-fill the empty barrel of our strategic reserves, the bottom of which has been well and truly scraped in recent months.

THE NORTH ATLANTIC TREATY ORGANISATION

The twelve-nation defence organisation set up under the North Atlantic Treaty, 1949, continued, despite frustrations and delays, to make steady progress. On the one hand, political and economic factors have applied the brake on progress toward the common goal of building up sufficient strength in Europe to deter Soviet aggression. Within this category have fallen the vexed question of the European Defence Community of France, Belgium, Holland, Luxembourg, Italy, and Germany, and, in particular, the status and role which the last-named country is to perform within it; the organisation of defence of the Eastern Mediterranean; the series of economic and political crises in France, and the serious drain upon her trained man-power caused by the war in Indo-China; and the shortages of raw materials for rearmament affecting the major industrial nations of the partnership.

On the other hand, there are many items of major achievement and progress to report. On April 2, 1951, General Eisenhower announced from Supreme Headquarters Allied Powers in Europe that he had assumed effective command of the Allied Armies in Europe. In effect these forces amounted initially to the American, British, and French forces of occupation in Germany, Austria, and Trieste, together with the small Belgian, Danish, and Norwegian contingents, and the United States Sixth Fleet in the Mediterranean. In terms of divisions of land forces this modest start foretold a formidable gap to be covered if the long-range target of at least sixty divisions by mid-1954 was to be reached.

By the end of 1951 the weakening economic position in Western Europe made it doubtful whether the intermediate target of twenty-eight divisions (France 10; U.S.A. 6; Britain 4; Italy 3; other nations 5) by June, 1952, which, it is understood, had been under discussion, would be attained. It came, therefore, as a surprise when, following the meeting of the North Atlantic Council at Lisbon in February, it was officially announced that by the end of 1952 General Eisenhower would have at his disposal "approximately fifty divisions in appropriate conditions of combat readiness." Commenting on this *The Times* wrote: 'It is difficult to understand the meaning of the communiqué published by the Council of the North Atlantic Treaty at the end of the meeting. The communiqué says member nations will provide this year about fifty divisions in appropriate conditions of combat readiness. Only the most ingenuous will suppose that General Eisenhower will have that number of divisions able to fight in Europe by the end of the year. The present force is generally believed to be less than half that number, and it is not easy to see how this can be substantially increased. Certainly, Britain is not going to send more divisions to Europe this year.' Obviously the communiqué did not mean that S.H.A.P.E. would comprise some fifty first-line divisions this year, but that taking reserve divisions into account, some of which no doubt would have to be shipped from U.S.A., General Eisenhower would, in the event of war, be able to count on his forces being brought up to that strength within a specified period. General Eisenhower later announced that roughly one half of the fifty divisions would be standing forces, the remainder planned as reserve divisions available for employment at periods varying from three to thirty days. In addition, it is planned to have 4,000

operational aircraft under S.H.A.P.E. by the end of 1952. The encouraging thought is that at Lisbon, for the first time, agreement was reached as to the military and economic share of the common defence burden to be borne by each of the partner-nations.

Briefly summarised the important results achieved at the Lisbon Conference were: agreement was reached on the bases and facilities (the so-called infra-structure) to be built for General Eisenhower's forces; the Paris plan for a European Defence Community, including Western Germany's contribution, was approved; agreement was reached by which the return of Western Germany to a place of equality and responsibility in the European Community could be achieved, N.A.T.O. itself was reorganised and strengthened by the decision to nominate permanent representatives from each nation, who would constitute the Council in permanent session. In future, the Council and its dependent committees are to be located at Paris, with a permanent secretariat under General Lord Ismay as Secretary-General.

Looking back over the past year, there appear many grounds for satisfaction at the achievements of General Eisenhower in welding into shape the forces of the various nations placed under his command. Much solid, if unspectacular, progress has been made in such matters as the integration of training, equipment, organisation, and staff duties. Gaps in the command structure have been filled by the appointments of General de Castiglioni (Italian Army) and Major-General David M. Schlatter (U.S.A.F.) as commanders of the Allied Land and Air Forces in Southern Europe respectively, under the Commander-in-Chief, Allied Forces in Southern Europe (Admiral Robert B. Carney, U.S.N.). General René Bertrand (French Army) has been appointed as deputy to Admiral Carney. It has also been decided to appoint French and Italian admirals to command the Western Mediterranean and the sea approaches to Italy respectively, under Admiral Carney, who himself is for the present to retain direct command of his naval forces. Vice-Admiral Leon-Marie Sala and Vice-Admiral Massimo Girosi have recently been appointed to these commands. In the Northern European command Lieut.-General Sir Robert Mansergh has been appointed deputy to the Allied Commander-in-Chief (Admiral Sir Patrick Brind). With the above appointments the Allied command structure under S.H.A.P.E. is now virtually complete, with one important exception, with which Chapter III of this issue deals. This is in the Eastern Mediterranean, where a vacuum has existed pending the admission of Greece and Turkey to N.A.T.O. General Eisenhower's command, therefore, now stretches from the North Cape to the Russo-Turkish frontier.

After the Prime Minister's visit to Washington in January, 1952, it was announced that the British Government had reached agreement with the United States over the question of the appointment of a Supreme Commander in the Atlantic. Mr. Churchill made it clear that he had acquiesced against his own personal judgment in the organisation negotiated under the former Government, and with the proviso that the British Admiralty should remain responsible for the waters westward of the British Isles up to the 100-fathom line (the potentially dangerous area from the point of view of mining operations). After this announcement N.A.T.O. Headquarters and the United States and British Governments announced the following appointments:

Supreme Allied Commander, Atlantic (S.A.C.A.): Admiral Lynde D. McCormick, U.S.N.

Deputy S.A.C.A.: Vice-Admiral Sir William Andrewes, R.N.

Allied Naval C.-in-C., Eastern Atlantic: Admiral Sir George Creasy, R.N. (at present C.-in-C., Home Fleet).

Allied Air C.-in-C., Eastern Atlantic: Air Marshal Sir Alick C. Stevens, R.A.F. (at present A.O.C.-in-C., Coastal Command).

In conformity with the principle of British responsibility for British home waters, the formation of a separate Channel Command was also announced, with the following appointments :

Allied C.-in-C., Channel Command: Admiral Sir Arthur J. Power, R.N. (at present C.-in-C., Portsmouth, and C.-in-C., Home Station, designate).

Allied Air C.-in-C., Channel Command: Air Marshal Sir Alick C. Stevens, R.A.F.

The Allied C.-in-C., Channel Command, is to be directly under the control of the British Chiefs of Staff through the Admiralty in so far as the protection of home waters is concerned. He is to be responsible for liaison and co-ordination with the Allied Naval C.-in-C., Eastern Atlantic, and at the same time he will be directed by a Channel Committee of N.A.T.O. This committee, comprising the Chiefs of Naval Staff of Belgium, France, the Netherlands, and the United Kingdom, will act as the local agency for the Standing Group of N.A.T.O.

It will thus be seen that the principle of a clear-cut chain of command has been sacrificed to national interests. The whole complex structure will depend on mutual understanding and co-operation between the high commands concerned and especially on the personalities of the commanders. The position of Allied C.-in-C., Channel Command, in particular calls for a man of unique qualifications in view of his diverse responsibilities. He would appear to be a veritable "Pooh Ba." The A.O.C.in-C., Coastal Command, will also need to be a man of equal ubiquity to his naval confrere of the Channel Command, since not only will he be a dual personality as C.-in-C., Eastern Atlantic and Channel Air Commands, but he will also presumably owe allegiance to the Air Ministry in the latter capacity. One is left with the impression that the present command organisation is interim, and that in due course some more orthodox structure will be evolved in the light of practical experience.

DEFENCE ESTIMATES, 1951-52

The Defence Estimates published on February 16, 1951, provided for a total expenditure of £1,113,700,100 during the financial year 1951-52. These estimates related to the three-year programme announced on September 12, 1950, and an accompanying note explained that in view of the recent revision of the defence programme it would probably be necessary to introduce Supplementary Estimates at a later date to bring the total up to about £1,300,000,000. The respective allocations to the three

Services and the Ministries of Supply and Defence (with 1950-51 figures for comparison) were as under :

			<i>Allocation</i>	
			1951-52	1950-51
			£	£
Royal Navy	..	..	278,500,000	203,000,000
Army	..	..	418,800,100	319,000,000
R.A.F.	..	..	328,750,000	233,000,000
Ministry of Supply	..	..	81,500,000	(Not included under under Defence Esti- mates.)
Ministry of Defence	..	..	6,212,000	4,069,779

In effect it appears, at the time of writing, that the total of defence expenditure during the year 1951-52 will fall short of the estimated figure of about £1,250,000,000 by some £150,000,000. As explained in the annual "Statement on Defence," presented to Parliament by the Prime Minister on February 21, 1952 (see p. 371), the reasons for this under-expenditure were the difficulties experienced in getting the necessary labour, materials, and machine tools, coupled with the general deterioration in the economic position with resultant competition between the conflicting demands on the metal-using industries for defence production and goods for export. It remains to be seen how far the agreement reached with the United States at the time of Mr. Winston Churchill's visit to Washington in January, 1952, for the purchase of one million tons of steel will alleviate the situation.

DEFENCE ESTIMATES 1952-53

The detailed estimates of net expenditure for 1952-53, as published in the "Statement on Defence" (see p. 371), are :

			£
Royal Navy	..	..	357,300,000
Army	..	..	521,500,000
R.A.F.	..	..	467,600,000
Ministry of Supply	..	..	98,500,000
Ministry of Defence	..	..	17,300,000

making a total of £1,462,200,000, from which must be deducted the figure of £85,000,000 promised in economic aid by the United States, giving a net figure of £1,377,200,000.

An examination of the main headings of expenditure shows that for the Army £156 millions is required for warlike stores (as compared with about £97 million for the previous year), and for the R.A.F. £191 millions for aircraft and stores (as compared with about £133 millions for the previous year), of this sum £111 million is for aircraft. For the Royal Navy the sum of over £218 millions is earmarked for shipbuilding, repairs, maintenance, and armaments. As in 1951-52, the emphasis in the naval programme of rearmament is to be mainly on the build-up of anti-submarine and mine-sweeping forces, and in the re-equipping of naval air squadrons with jet aircraft.

MANPOWER

The strength of the Regular (i.e. full-time) Forces on April 1, 1951, was 809,200, made up as follows :

		Regular	National Service	Women	Total
Royal Navy	..	125,600	7,200	5,400	138,200
Army	..	202,200	223,500	7,500	433,200
R.A.F.	..	139,400	88,900	9,500	237,800
Grand Total	..	467,200	319,600	22,400	809,200

In addition the Volunteer Reserve and Auxiliary Forces comprised some 145,000 men and women volunteers, to which figure must be added the steady flow of National Servicemen, who, under the National Service Act, 1948, began to pass into the Reserve and Auxiliary Forces for part-time service early in 1951. By February, 1952, this inflow had mounted to about 152,000—8,000 in the Royal Navy, 105,000 in the Army, and 39,000 in the Royal Air Force.

The estimated strength of the Regular Forces on April 1, 1952, was 857,100, made up as follows:

		Regular	National Service	Women	Total
Royal Navy	..	135,400	4,400	5,300	145,100
Army	..	209,800	224,300	7,900	442,000
R.A.F.	..	173,500	86,000	10,500	270,000
Grand Total	..	518,700	314,700	23,700	857,100

The official strength of the Volunteer Reserve and Auxiliary Forces on January 1, 1952, was about 139,000 men and women, made up as follows:

Royal Naval Reserve	..	..	..	..	3,062
Royal Naval Volunteer Reserve	..	..	..	..	8,287
Royal Marine Forces Volunteer Reserve				..	878
Territorial Army and W.R.A.C. (T.A.)	..		..	..	100,961
Supplementary Reserve (Army)	..	..	..	..	6,139
Royal Auxiliary Air Force and W.R.A.F.				..	8,453
Royal Air Force Volunteer Reserve and W.R.A.F.					
V.R.	..	..	..	..	12,105
Total	..	..			139,885

Referring back to the 1951-52 Defence Estimates published in February, 1951, we find that the planned strengths of men and women in the Regular Forces in 1951-52 were:

Royal Navy	..	..	143,000
Army	..	..	527,000
R.A.F.	..	..	270,000
Total	..	..	940,000

Comparing this total with the estimated total strength for April 1, 1952 (857,100) shows a deficiency of some 83,000. A detailed examination of the published figures shows that in part this deficiency was due to a reduction in the number of men offering themselves for Regular engagements in the Army. In this connection the following extract from the "Statement on Defence, 1952" is of particular import: "In the Army and Air Force a serious decline in Regular recruitment took place between

1947 and 1949. This decline was arrested by the pay increases of September, 1950. In the Air Force, the effect of these pay increases in combination with other improvements in the conditions of Regular Service, including the three-year engagement and longer service careers, based on a new trade structure, was to give a rate of Regular recruitment in 1951 between three and four times that prevailing in 1948 and 1949. In the Army the rate of recruitment between September and December, 1950, was nearly double that in the earlier months of the year, but this improvement was not maintained in 1951, during which year recruiting fell back nearly to 1949 level. The Army have, however, now introduced a new type of three-year engagement. Present indications are that it is attracting substantially greater numbers. The disappointing results in Regular Army recruiting, however, has been to some extent counterbalanced by a small but progressive improvement in the numbers of men offering themselves for re-engagements and extensions of service since 1950. Nevertheless the situation is still far from satisfactory.

In passing it is of interest to note that according to the Defence Estimates the Royal Air Force will in the coming year for the first time in history be the strongest of the three services as regards Regular personnel. This is shown in the following table of estimated manpower on April 1, 1953.

			National			
			Regular	Service	Women	Total
Royal Navy	..	..	133,700	5,800	5,900	145,400
Army	..	..	207,800	240,200	9,500	457,500
R.A.F.	..	..	213,000	73,000	11,500	297,500
<hr/>			<hr/>			<hr/>
Grand Total	..	..	554,500	319,000	26,900	900,400

In accordance with the policy initiated last year the recall for training of Class "Z" (Army) and Class "G" (R.A.F.) reservists for 15 days will continue in 1952. The numbers involved will be approximately 190,000 in Class "Z" and 4,700 in Class "G". To maintain the Navy up to the strength the present policy of recalling ratings from the Royal Fleet Reserve for up to 18 months' service and the retention of officers due for retirement will be continued in 1952-53.

THE WAR IN MALAYA

The bitter struggle against the Communist guerilla forces in Malaya entered its fourth year last June. Although military action by the armed forces and police has succeeded in containing the guerillas, whose immediate aim is complete disruption of the economic life of the country, the toll of death and destruction has continued. The official list of casualties from June 1948 up to the end of December 1951 included civilians, killed 1,828, wounded 1,104, missing 496; police, approximately 1,000 killed and a equal number wounded. To these must be added military casualties, the corresponding figures for which have not been published. The Communist losses for the same period were estimated to be 2,700 killed, 1,350 wounded, 870 captured, and 660 surrendered. All credit is due to the planters and miners and their employees, who under the ever-present threat of violent death, have continued to carry out their daily tasks of

producing a constant flow of rubber and tin, whereon the economic life of the country so largely depends.

On the other hand, it is not easy to judge whether the political movement is being held. Encouraging signs are the number of armed terrorists who have surrendered, and the progress made in the Briggs plan of resettling Chinese squatters. Up to the end of the year some 350,000, out of an estimated 500,000 squatters, had been moved into resettlement areas, where they are granted plots of land and given a considerable measure of protection. But until the bulk of the Chinese population can be brought into active opposition to the Communists, who derive their support from a minority of the Chinese population, the struggle will continue. The crux of the problem is to integrate the two million Chinese inhabitants into the political life of the country, with the agreement and willing co-operation of some two and a half million Malays. Malayan citizenship for the Chinese and their admission into the Malayan regular forces and the police are amongst the problems which await full solution.

Meanwhile some 40,000 regular troops have been engaged in the fighting, including 25,000 British (Army, Royal Navy, Royal Marines and Royal Air Force), 10,500 Gurkhas, and five battalions of the Malay Regiment. Early in the year under review the Air Force in Malaya received welcome assistance from the Commonwealth in the form of squadrons of the Royal Australian Air Force and the Royal New Zealand Air Force. In recent months East Africa has contributed the 1st (Nyasa) and 3rd (Kenya) Battalions, King's African Rifles, and the 1st Battalion, Fijian Regiment, has arrived from Fiji. In addition there are approximately 100,000 regular and armed auxiliary police engaged in the struggle, together with close on 250,000 Home Guards and Kampong (i.e. village) Guards.

On October 6, 1951, Sir Henry Gurney, the High Commissioner, fell victim to an ambush whilst travelling by car between Kuala Lumpur and Fraser's Hill. He was travelling under police escort which came under heavy fire. Sir Henry Gurney was shot after he had got out of his car. At the same time his driver and six of the escort were wounded. The appointment of his successor was deferred for some months.

In November Lieutenant-General Sir Harold Briggs completed 18 months tenure of the appointment of Director of Operations and was succeeded by General Sir Rob Lockhart, late Indian Army, who was appointed the first Commander-in-Chief of the Indian Army under the new constitution in August, 1947.

Following the visit of the Secretary of State for the Colonies (Mr. Oliver Lyttleton) to Malaya in December, 1951, General Sir Gerald Templer was appointed High Commissioner with "complete operational command over all armed forces assigned to operations in the Federation." This in effect means that the High Commissioner is now empowered to issue direct orders to the Service Commanders in Malaya, without reference to the three Commanders-in-Chief, Far East, at Singapore. Previously the High Commissioner, whilst in full control of the regular and auxiliary police forces, had no authority over the armed forces, which operated under the orders of their Commanders-in-Chief. The new organisation does not, of course, give the High Commissioner any authority over Singapore Island, which politically and militarily remains a separate entity.

Few will envy General Templer the task which confronts him. The

problems with which he is faced are formidable. But at least he will have the advantage over his predecessors in that control in both the civil and military spheres has now been placed in one man's hands. This was a measure long overdue, and which might have been prompted sooner by the measure of achievement attendant upon the appointment of the late General de Lattre de Tassigny as High Commissioner and Commander-in-Chief in French Indo-China under somewhat parallel circumstances to those prevailing in the Federation of Malaya. Any prophecy as to the future course of events would be idle. Much depends upon future events outside Malaya, especially in Indonesia, Indo-China, Burma, and Siam. The situation in Malaya remains serious but by no means hopeless.

BRITISH FORCES IN KOREA

British naval and military forces in Korea have continued to acquit themselves with a distinction out of proportion to their strength relative to the total of United Nations forces engaged in the war.

In April, 41st Independent Commando, Royal Marines, landed at Songjin on the east coast of North Korea and destroyed a section of the main railway. The whole operation was carried out with complete success and no casualties were incurred by the unit. A month later a similar operation was carried out by the Royal Marines on the west coast, in which enemy installations were destroyed. At the end of August seven ships of the Commonwealth navies assisted by small craft of the South Korean Navy entered the unchartered Han River and bombarded enemy positions on the western end of the front. Throughout the year ships and aircraft of the Royal Navy have been continuously engaged in patrol activity of the enemy's coastline and in the engagement of targets in support of landforces.

During the advance of the United Nations forces to the 38th parallel early in the year the British Commonwealth 27th Brigade and British 29th Brigade were operating on the central sector of the front and were engaged in some of the heaviest fighting of the campaign. On April 23, the Communist forces launched an offensive on a 100-mile front between Inje on the east central sector and a point about 30 miles north of Seoul. During the heavy fighting which ensued the 1st Battalion, Gloucestershire Regiment, and "C" Troop, 170th Independent Mortar Battery, R.A., were forced into a perimeter defence on Hill 235 near Solmari, northwest of the Imjin River. Although confronted by the full weight of 83rd Chinese Army, the battalion stood its ground, inflicting terrific casualties on the enemy, until finally with ammunition almost depleted their position was overrun on the third day. For this outstanding feat both units were awarded a citation by the President of the United States, from which the following is an extract :

On April 24, the weight of the attack had driven the right flank of the Battalion back. The pressure grew heavier and heavier and the Battalion and attached unit were forced into a perimeter defence on Hill 235. During the night heavy enemy forces had by-passed the staunch defenders and closed all avenues of escape. The courageous soldiers of the Battalion and attached unit were holding the critical route selected by the enemy for one column of the general offensive designed to encircle and destroy I Corps. These gallant soldiers would not retreat. As they were compressed tighter and tighter in their perimeter defence they called for close-in air strikes to assist in holding on. Completely surrounded by tremendous numbers these indomitable, resolute, and tenacious soldiers fought back with unsurpassed fortitude and



Truce Talks in Korea. The Conference Room at Kaesong

courage. As ammunition ran low and the advancing hordes moved closer and closer, these splendid soldiers fought back viciously to prevent the enemy from over-running the position and moving rapidly to the south. Their heroic stand provided the critically needed time to regroup other I Corps units and block the southern advance of the enemy. Time and again efforts were made to reach the Battalion but the enemy strength blocked each effort. Without thought of defeat or surrender this heroic force demonstrated superb battlefield courage and discipline. Every yard of ground they surrendered was covered with enemy dead until the last gallant soldier of the fighting Battalion was overpowered by the final surge of the enemy masses.

A further citation by the President of the United States was awarded to the 3rd Battalion, Royal Australian Regiment, for its very gallant stand at Kapyong during the same period.

With the arrival of the 25th Canadian Infantry Brigade in May, and the relief of 27th Infantry Brigade by 28th Infantry Brigade, the Commonwealth troops were formed into the 1st (Commonwealth) Division under the command of Major-General A. J. H. Cassells, and comprising 28th and 29th United Kingdom Brigades, 25th Canadian Brigade, 3rd Battalion, Royal Australian Regiment, 16th Field Regiment, Royal New Zealand Artillery, and 60th Indian Field Ambulance. By the end of July the Division was reported complete and ready for operations. During the protracted period of armistice negotiations the Division has been employed on the west central sector of the front and has been heavily engaged on several occasions in the areas of Yonchon and Korangpo, east of the Imjin River. During the year 8th Hussars, 1st Middlesex, 1st Argyll and Sutherland Highlanders, 1st Royal Northumberland Fusiliers, 1st Gloucester, and 1st Royal Ulster Rifles have been withdrawn from Korea and relieved by 5th Royal Inniskilling Dragoons, 1st K.O. Scottish Borderers, 1st K.S.L.I., 1st Royal Norfolk, 1st Royal Leicestershire, and 1st Welch.

MINISTRY OF DEFENCE

MINISTER OF DEFENCE

On the change of Government in October, the new Prime Minister, Mr. Churchill, reassumed for the time being his wartime portfolio at the Ministry of Defence. It was not expected that the Prime Minister would for long feel himself called upon to bear the heavy burden of his dual roles. It came, therefore, as no surprise when in March after his relinquishment of the appointment of Governor-General of Canada, it was announced that Her Majesty the Queen had been pleased to appoint Field-Marshal Lord Alexander of Tunis to become Minister of Defence.

HOME DEFENCE

On May 1, 1951, the Ministry of Defence announced that the Government had decided that the responsibility for the defence of the United Kingdom in the event of war should be exercised by three Commanders-in-Chief responsible to the Chiefs of Staff, and that these Commanders-in-Chief would be :

Commander-in-Chief, Home Station : the C.-in-C. Portsmouth (Admiral Sir Arthur Power).

Commander-in-Chief, United Kingdom Land Forces.

Commander-in-Chief, Fighter Command (Air Marshal Sir Basil Embry)

General Sir Miles Dempsey was recalled from the Retired List and appointed C.-in-C., United Kingdom Land Forces. He acts as Chairman of the new organisation which is known as the Commander-in-Chiefs (United Kingdom) Committee. The task of the Committee is to carry out the necessary planning in conjunction with the Government Departments concerned and the Civil Defence Services.

IMPERIAL DEFENCE COLLEGE

In January, 1952, General Sir Frank E. W. Simpson, K.C.B., K.B.E., D.S.O., succeeded Admiral Sir Charles Daniel, K.C.B., C.B.E., D.S.O., as Commandant of the Imperial Defence College. The following vacancies were allotted for the 1952 course at the College: Royal Navy, 8; Army, 11; Royal Air Force, 9; Australia, 4; Canada, 4; India, 2; New Zealand, 2; Pakistan, 2; Foreign Service, 2; Colonial Service, 1; Home Civil Service, 9; United States, 4.

COMBINED TRAINING

In May, 1951, a three days' combined exercise involving all three Services was staged at Portsmouth and in the Isle of Wight as a demonstration for students of the Services' Staff Colleges. The exercise was directed by Major-General H. T. Tollemache, Royal Marines, and was designed to demonstrate the latest methods and equipment used in amphibious assault landings. In the same month a combined exercise for the Reserve Forces was held in the neighbourhood of Lulworth Cove. It took the form of an amphibious landing in which units and aircraft of the R.N.V.R., 56th (London) Armoured Division (T.A.), and R.M.F.V.R. participated in conjunction with ships and aircraft of the Royal Navy.

SERVICE PENSIONS AND TERMINAL GRANTS

On July 30, 1951, the Ministry of Defence published new and increased scales of retired pay and pensions for members of the Regular Armed Forces. At the same time a scale of terminal grants was introduced designed to assist men and women on leaving the Service to set themselves up in civil life. The measures were undoubtedly designed to boost recruiting of both officers and other ranks rather than to compensate for rises in the cost of living. They would better have served their purpose as a token of the security and prospects offered by a career in the Services had they been applied retrospectively to all those who served their country in two World Wars. As it is, the new rates and grants are only applicable to those who were discharged on pension or retired on or after September 1, 1950.

THE ROYAL NAVY

With the destruction of the German and Japanese navies in World War II the task of the Royal Navy no longer includes the necessity to meet the threat of a hostile surface battle fleet. Its main task, in conjunction with the navies of the N.A.T.O. countries and the Dominions, is now to maintain command of the sea, in order to safeguard sea communications in time

of war. The threat to these is as great as ever. It calls for measures designed to combat the mine, the submarine and air-borne weapons, the offensive powers of which have advanced greatly in recent years. These measures have been reflected in the Naval Estimates for the last two years, in which about half of the funds allotted have been ear-marked for research; for the production of new types of destroyers, frigates, minesweepers, and small craft equipped for anti-submarine and anti-mine duties; for improving the under-water speed of submarines; and for increasing the strength and striking power of our carrier fleet. Much preliminary work has been accomplished in the drawing up of designs and in placing orders for new construction, but the work has fallen short of what was planned owing to shortages of raw materials, especially steel. In the coming year shortage of manpower in the shipbuilding yards is likely to prove a further difficulty. In the production of naval aircraft (as indeed of all types of aircraft) serious difficulties are being encountered owing to the run-down of our wartime aircraft industry and the migration of its skilled labour to other industries.

Reviewing the naval picture as a whole, and however much one may deplore the decline in our over-all naval strength, the scene is not unpleasing, bearing in mind that in the foreseeable future the Commonwealth navies will not be called upon to guard the sea lanes of the world single-handed and that in skill, experience and morale the Royal Navy is still second to none.

FLAG APPOINTMENTS

The following important flag appointments took place or were announced during the year on the dates given:

First Sea Lord: Admiral Sir Roderick R. McGrigor, G.C.B., D.S.O. (December)

Vice Chief of the Naval Staff: Vice-Admiral Guy Grantham, C.B., C.B.E., D.S.O. (October)

Fourth Sea Lord: Rear-Admiral S. M. Raw, C.B., C.B.E. (February)

Fifth Sea Lord: Rear-Admiral E. W. Anstice, C.B. (September)

Home Fleet: Admiral Sir George E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O., to be Commander-in-Chief (January)

Mediterranean: Vice-Admiral The Earl Mountbatten of Burma, K.G., P.C., G.C.S.I., G.C.I.E., G.C.V.O., K.C.B., D.S.O., LL.D., D.C.L., D.Sc., to be Commander-in-Chief (May, 1952)

Plymouth: Vice-Admiral M. J. Mansergh, C.B., C.B.E., to be Commander-in-Chief (November)

West Indies: Vice-Admiral Sir William G. Andrews, K.B.E., C.B., M.V.O., to be Commander-in-Chief (October)

Flag Officer (Flotillas), Home Fleet: * Rear-Admiral W. G. A. Robson, D.S.O., D.S.C. (December)

First Cruiser Squadron: Rear-Admiral R. A. B. Edwards, C.B., C.B.E., to be Flag Officer Commanding (August)

* A new appointment. At the same time the appointment of Flag Officer, 2nd Cruiser Squadron, lapsed and cruisers of the Home Fleet (other than H.M.S. *Superb*, flagship of F.O.F.H.) came under command of Flag Officer Commanding, 3rd Aircraft Carrier Squadron, who assumed the title of Flag Officer, Heavy Squadron, Home Fleet (F.O.H.S.)

Rosyth: Rear-Admiral J. H. F. Crombie, D.S.O., to be Flag Officer, Scotland, and Admiral-Superintendent (August)

Flag Officer, Malaya: Rear-Admiral A. F. Pugsley, C.B., D.S.O. (December)

Germany: Rear-Admiral R. St. V. Sherbrooke, V.C., D.S.O., to be Chief British Naval Representative on the Allied Control Commission (November)

Mediterranean Destroyers: Rear-Admiral F. R. Parham, C.B., C.B.E., D.S.O. (October)

Submarines: Rear-Admiral G. W. G. Simpson, C.B., C.B.E. (January)

Australian Fleet: Rear-Admiral J. W. M. Eaton, D.S.O., D.S.C., to be Flag Officer Commanding, H.M. Australian Fleet (October)

Indian Navy: Rear-Admiral C. T. M. Pizey, C.B., D.S.O., to be Commander-in-Chief (October)

Royal Naval College, Greenwich: Vice-Admiral C. A. L. Mansergh, C.B., D.S.C., to be President (March)

Director of Naval Construction: V. G. Shepheard, Esq., C.B., M.I.N.A. (October)

On March 30, 1951, the appointment of Director of the Naval Education Service was upgraded to the rank of Rear-Admiral. The present incumbent, Instructor Rear-Admiral W. A. Bishop, C.B., O.B.E., M.A., A.D.C., thus becomes the first officer in peacetime to hold that rank in the Royal Navy.

For the first time in history a sea-going scientific adviser has been appointed to the staff of a Commander-in-Chief. On May 21, 1951, R. J. Gossage, Esq., was appointed in that capacity to C.-in-C., Home Fleet.

PERSONNEL

On the outbreak of war in Korea and to meet the measures designed to increase the preparedness of the Fleet the Admiralty called for volunteers from officers of the Emergency and Retired Lists and the Reserves for 18 months' service on the Active List. The response to this appeal was good. In addition a number of officers due for retirement were retained in the Service. These measures are to be continued during the coming year. In addition some of the volunteers are being offered Regular commissions, and others retained or recalled are being offered an additional 18 months' to 3½ years' service on normal terms. In this way it is hoped to maintain a satisfactory cadre of officers on the Active List of the Fleet. The officer position in naval aviation is not, however, so satisfactory, despite the number of ex-naval pilots and those serving in the R.N.V.R. who have volunteered for short-service Regular commissions. To meet the deficiencies Regular ratings and National Service officers are now permitted to apply for short-service commissions of 8 years. From these short-service officers up to 20 per cent. may eventually be offered permanent Regular commissions.

The strength of the Fleet in ratings was maintained during 1950-51 by the recall of reservists and by the retention in the service of men on completion of their normal engagements. By the end of 1951 some 5,000 Royal Fleet Reservists had been recalled, and in the forthcoming year it is

intended to call up a further 3,500. Recall and retention are for a maximum period of 18 months. It will be necessary to continue both these measures for some time, but the First Sea Lord has held out hopes of progressively reducing the period of retention from 1953. Recalled reservists are being given the opportunity of volunteering to remain in the service for a total of 5 to 7 years from the date of their recall, with the prospects of re-engaging for longer periods at the end of those times. Despite an improvement in the re-engagement rate and the generally satisfactory rate of Regular recruiting it has been found necessary to increase the National Service intake during 1952-53 to over 3,000 men.

WOMEN'S ROYAL NAVAL SERVICE

In April, 1951, His Late Majesty approved a change in title of the appointments of Commandant and Director, W.R.N.S. Consequently H.R.H. The Duchess of Kent became Chief Commandant, W.R.N.S., and Miss M. K. Lloyd, O.B.E., A.D.C., became Commandant, W.R.N.S. In the New Year's Honours List Miss Lloyd was promoted Dame of the British Empire (D.B.E.).

His Late Majesty also approved the introduction of a uniform black bolero and white blouse for wear by officers to adapt their day uniform for occasions when mess undress or mess dress is worn by male officers. The uniform was approved by H.M. The Queen-Mother as Commandant-in-Chief, W.R.N.S. Recruiting for the Women's Royal Naval Reserve recently opened and provision has been made for a maximum strength of 1,500 officers and ratings in the 1952-53 Estimates. Whilst volunteers will legally have no training liability, they will be encouraged to attend evening instruction at R.N.V.R. Headquarters and full-time annual periods of training at shore establishments.

ROYAL NAVAL RESERVE

In July, 1951, His Late Majesty approved new conditions of service in the R.N.R. Patrol Service to bring the rank and status of these officers more into line with their present responsibilities. Instead of the Skipper Class appointments introduced in 1910 for the Old R.N.R. Trawler Division (the predecessor of the Patrol Service) officers entering in future will be graded as probationary sub-lieutenants with the same promotion to lieutenant and lieutenant-commander as R.N.R. General Service officers. The special small-ship experience of the Patrol Service is to be retained, and it is not intended that officers shall be posted to vessels larger than trawlers in war. Officers now on the Active List are to be given the option of transferring, if selected, to the new ranks, remaining in their present ranks under existing conditions, or retiring. Chief skippers and skippers selected for transfer will become lieutenants or sub-lieutenants according to their seniority and war service. Skipper lieutenants will become lieutenant-commanders.

ROYAL NAVAL VOLUNTEER RESERVE

To bring the R.N.V.R. further into line with the R.N., approval has been given to the allocation of ships' names to the twelve R.N.V.R. divisions. The cap ribbons worn by R.N.V.R. ratings will in future carry the appropriate ship name preceded by "H.M.S."

The following ship names have been selected:

Ulster	..	..	..	H.M.S. Caroline
Sussex	..	..	..	H.M.S. Sussex
Tay	..	..	..	H.M.S. Cressey
Severn	..	..	..	H.M.S. Flying Fox
London	..	..	..	H.M.S. President
Forth	..	..	..	H.M.S. Claverhouse
Clyde	..	..	..	H.M.S. Graham
Solent	..	..	..	H.M.S. Wessex
Mersey	..	..	..	H.M.S. Eaglet
Humber	..	..	..	H.M.S. Galetea
South Wales	..	..	..	H.M.S. Cambria
Tyne	..	..	..	H.M.S. Calliope

(or Northumbria)

In June 1952 five R.N.V.R. divisions combined to form a minesweeping flotilla for a week's exercise in the Firth of Forth.

During the year a new R.N.V.R. air squadron was formed. The squadron is based at R.N. Air Station, Ford, near Arundel. This brings the number of R.N.V.R. air squadrons up to five—three fighter and two anti-submarine. Steps are in hand to increase the strengths of all the squadrons by increasing their pools of "reserve flyers" (i.e. those pilots and observers on List II) and by increasing the number of active non-aircrew officers attached to squadrons, e.g. engineer, electrical, medical, air traffic control officers.

ROYAL MARINES

The 41st Independent Commando, which was formed for service in Korea, was withdrawn from the Far East in January, 1952, and has since been disbanded. The unit served with great distinction in Korea from September, 1950. It will long be remembered for the gallant part it played in the withdrawal from the Chosin Reservoir in December, 1950, when serving with the United States 1st Marine Division. The 3rd Commando Brigade, which was moved to Malaya from Hong Kong in June, 1950, has continued to be responsible for law and order in the State of Perak, one of the most troublesome areas in the Peninsula. Up to January, 1952, the Brigade had accounted for 147 bandits killed and 431 captured. The Brigade had lost 4 officers and 14 other ranks killed.

The return of the R.M. detachment from H.M.N.Z.S. Bellona in December 1951 marked the end of Royal Marine service in New Zealand ships, which started in 1924.

On August 1, 1951, H.R.H. The Duke of Edinburgh presented new Colours to the Royal Marine Barracks, Plymouth. The old Colours were presented by H.R.H. The Duke of Saxe-Coburg and Gotha, Duke of Edinburgh, Honorary Colonel of the Royal Marines, in 1896.

On May 11, 1951, Lieutenant-General Sir Leslie C. Hollis, K.C.B., K.B.E., Commandant General, Royal Marines, was promoted to be General. General Hollis paid a visit to the United States Marine Corps in the autumn and toured the principal U.S.M.C. centres. Major-General H. T. Tollemache, C.B., C.B.E., relieved General Hollis as Commandant General in May, 1952.



Catapulting an Attacker from H.M.S. Eagle

In September, 1951, Major-General J. C. Westall, C.B.E., relieved Major-General W. I. Nonweiler, C.B.E., as Chief of Staff to the Commandant General. In November, 1951, Major-General R. F. Cornwall, C.B.E., was appointed Major-General Royal Marines, Plymouth.

ROYAL FLEET AUXILIARY SERVICE

On October 5, the rank of Commodore was instituted in the Royal Fleet Auxiliary Service. Captain S. G. Kent the first holder of the post, has commanded Royal Fleet Auxiliaries for over 27 years. His broad pennant, comprising an anchor surrounded by a gold rope circle on a navy blue field, was first hoisted in the R.F.A. Fort Dunvegan at Rosyth on October 7 in the presence of the C.-in-C., Home Fleet (Admiral Sir Philip Vian). The R.F.A. Service at present comprises over 80 vessels.

ROYAL NAVAL MINE-WATCHING SERVICE

During the defence debate in the House of Commons on December 6, 1951, the Prime Minister announced that the Government had decided to set up a mine-watching organisation. The organisation will be open to volunteers, whose duty in war will be to spot mines dropped by enemy aircraft in our major ports and estuaries. At least 30,000 volunteers are required, of whom more than half will be required to give full-time service in war.

MATERIAL

The new fleet carrier H.M.S. Eagle, after completing her trials during the winter months, was commissioned early in 1952, and has since embarked No. 800 Squadron equipped with Attackers and No. 827 Squadron equipped with Firebrands. The Eagle has an overall length of 804 feet and a beam of 113 feet. Her full peacetime complement will be 2,000 officers and men. The armament includes 16 4·5-inch guns in twin turrets and numerous multiple and single 40-mm. Bofors guns. Her sister ship Ark Royal, now being fitted out, is due for completion in 1954. Of existing carriers, only H.M.S. Victorious is at present committed to modernisation. Of the four Hermes class light fleet carriers now under construction, the first ship Centaur is due for contractor's trials early in 1953, and will be followed by the second ship Albion a few weeks later.

Two of the new 'Daring' class destroyers (Daring and Diamond) were completed during the year, the remaining six, with the exception of Diana, are due for completion during the coming year, and Diana is due for completion in the summer of 1953.

In introducing the Navy Estimates in the House of Commons on March 6, 1952, the First Lord (Mr. J. P. L. Thomas) stated that four types of frigates were under construction—two for anti-submarine work, a third for anti-aircraft, and a fourth for aircraft direction. Two of the anti-submarine type had been laid down and construction was well under way, whilst the conversion of 13 destroyers to anti-submarine frigates was in hand. The programme of new construction also included 30 coastal and 29 in-shore mine-sweepers, some of which were due for completion during the financial year 1952-53.

Construction of the three 'Tiger' class cruisers had been suspended pending a review of their armament, but the modernisation of H.M.S. Birmingham, Newcastle, and Newfoundland was nearing completion.

The modernisation of two submarines had been completed, resulting in material improvement in under-water speed, and work was in hand on several others. At the same time all possible future means of submarine propulsion were being pursued, including systems using nuclear energy and oxygen-bearing fuels.

A second gas turbine unit for the Royal Navy—a 52-foot dockyard launch—was completed, powered with a Rover gas turbine engine weighing 600 lb. in replacement of the conventional 2½-ton diesel engine. The first gas turbine craft—an M.T.B.—is already in service and was demonstrated on the Thames during the Festival of Britain.

On April 17, 1951, H.M. Submarine *Affray* was lost in the Channel whilst on exercise, having on board 24 officers, 46 ratings and 4 Royal Marines. The details are described in Chapter XV.

On April 27, 1951, the naval armament vessel *Bedenham*, loaded with ammunition, blew up in Gibraltar harbour with a loss of 13 lives and 11 others seriously injured. As far as could be ascertained the cause of the disaster was the ignition of a depth charge in a lighter moored alongside the ill-fated vessel.

NAVAL AVIATION

The light fleet carrier H.M.S. *Theseus* returned to Portsmouth at the end of May, 1951, after serving in Korean waters since October, 1950. In recognition of her outstanding performance in the period October to December, 1950, her Carrier Air Group (No. 17) was presented with the Boyd Trophy, which is awarded annually for the finest feat of aviation in the Royal Navy. H.M.S. *Glory* relieved the *Theseus* in the Far East and put up an equally fine record of operational flying. Each of her pilots averaged 40–50 flying hours per month and the average serviceability of aircraft was close on 90 per cent. In September the *Glory* in turn was relieved by H.M.A.S. *Sydney* whilst the former proceeded to Australia for refit and to rest her crew.

Of the fleet carriers, H.M.S. *Indomitable* was flagship of the Home Fleet, and as previously recorded has now been joined by H.M.S. *Eagle* in the Active Fleet. Of the remaining five fleet carriers, three are employed on training and experimental work, whilst two are in reserve, one of them—the *Victorious*—undergoing modernisation.

During the year a start was made in the re-equipping of squadrons with jet aircraft. No. 800 Squadron was formed in August, 1950, and is being equipped with Supermarine F1 Attackers single-jet aircraft for embarkation in H.M.S. *Eagle*. The Attacker is fitted with a Rolls Royce "Nene" centrifugal-flow turbine-jet engine. It is designed to replace the Sea Fury as an interim type pending delivery of the Sea Hawk, which will be armed with four 20-mm. cannons and a rocket battery. A somewhat similar aircraft, the Sea Venom, is also on order. It is designed as a day and night fighter and will carry the same armament as the Sea Hawk. Also on order is the Fairey 17. This aircraft, designed for anti-submarine work, is fitted with twin airscrew-turbine engines. The power unit is the Armstrong-Siddeley "Double Mamba," which consists of two engines side by

side in one unit, giving twin-engine safety combined with the aerodynamic cleanliness of a single-engine type.

Of future types of aircraft the most interesting is the Supermarine 508, which made its first appearance in public at the Farnborough Show of the Society of British Aircraft Constructors in September, 1951. Equipped with two Rolls Royce "Avon" jets, it was claimed to be the fastest and most powerful naval fighter in the world and is designed for carrier-borne operation.

Recent introductions into the Service in the piston-engined field are the Fairey Firefly 6 and 7 designed for anti-submarine work. Other types under development, but still on the secret list, include the Fairey Gannet—also for anti-submarine work—and a swept-back wing jet-engined interceptor fighter. In the meantime the Royal Navy has received the first shipment of American Skyraiders. These aircraft are the standard strike aircraft of the United States Navy, modified for long-range purposes and equipped with radar. They will be primarily used for anti-submarine duties.

The Admiralty recently announced that they had under development a new type of catapult capable of launching the future heavier and faster types of aircraft from carriers. This steam-operated catapult has been fitted to H.M.S. Perseus. After highly successful trials in home waters the Perseus sailed to the United States early in 1952 to undertake further trials and demonstrations with the United States Navy. Reports indicate that the catapult is likely to be among the most important developments in naval aviation since World War II. The catapult uses the principle of the slotted cylinder and has no rams or hydraulic purchases. It was invented by an R.N.V.R. officer, Commander (E.) C. C. Mitchell, O.B.E., of Messrs. Brown Bros. and Co., Ltd., who designed and built the catapult in H.M.S. Perseus.

FLEET CHANGES, EXERCISES, AND CRUISES

Combined exercises with the navies of Commonwealth and N.A.T.O. countries are now a normal feature of R.N. training. Several such exercises took place during the year, which are fully dealt with in another chapter.

In April the East Indies Fleet combined with ships of the Indian, Royal Pakistan, and Ceylonese Navies off Ceylon, and in October ships of the South Atlantic Station combined with ships of the South African Navy for anti-submarine and other exercises.

During the Anglo-Iranian crisis the cruiser H.M.S. Euryalus was anchored off Abadan for eight weeks. She was supported by destroyers of the 3rd Flotilla, Mediterranean. The Euryalus was eventually relieved by H.M.S. Mauritius, which carried out the final evacuation of Anglo-Iranian Oil Company staff on October 3, and then returned to Chatham.

H.M.S. Gambia was to have relieved the Mauritius in the East Indies, but owing to the serious situation in the Suez Canal Zone she was halted at Port Said to ensure the flow of traffic through the canal. This operation is described in Chapter XIII.

On her return from the Mediterranean, where she had been temporarily acting as flagship of the Home Fleet on exercises, the battleship H.M.S. Vanguard returned to her normal role of flagship Training Squadron. Later in the year she started refitting in preparation for the cruise of His

Late Majesty to South Africa. Other changes in major units of the Fleet during the year included the light fleet carrier Ocean and the cruiser Cleopatra to the Mediterranean, the latter in relief of the Phoebe.

OBITUARY

Admiral of the Fleet Sir Reginald Tyrwhitt, G.C.B., D.S.O., D.C.L., died on May 30, 1951, at the age of 81. At the outbreak of the 1914-18 war he was Commodore commanding the Home Fleet flotillas based on Harwich. Subsequently as Rear-Admiral he commanded the Harwich Force throughout the war. This Force was engaged in numerous actions, including the Battle of the Heligoland Bight, in which three German cruisers were destroyed on August 28, 1914, and the Battle of Dogger Bank in January, 1915. In 1921 Tyrwhitt was appointed to command 3rd Cruiser Squadron in the Mediterranean. His subsequent appointments included Commander-in-Chief, China Station, and Commander-in-Chief, the Nore. He was promoted Admiral of the Fleet in 1934.

THE ARMY

The re-forming of three Regular divisions as part of the expansion programme following the outbreak of war in Korea was completed by the early summer of 1951. All three have since taken part in exercises either at home or in Germany. The 6th and 11th Armoured Divisions are both stationed in Germany, and together with the 7th Armoured Division form a major element in the armour under General Eisenhower's command. The 3rd Division together with the 16th Independent Parachute Brigade Group was intended to form the strategic reserve in England.

Following the tense situation in the Persian Gulf arising from the Anglo-Iranian oil dispute, the Parachute Brigade Group was despatched to Cyprus in June. In the autumn the serious outbreak of violence in the Suez Canal Zone necessitated the despatch of the 3rd Division from England to reinforce General Erskine's troops in Egypt. The Parachute Brigade was also moved there from Cyprus. By the end of the year, therefore, the strategic reserve had been committed overseas and there were no active formations left at home. The measures taken to meet this situation have already been outlined.

With four Regular divisions in Germany, two in the Middle East and the equivalent of at least two more in the Far East, the Regular Army overseas now amounts to a strength approximating to ten divisions. These forces are composed of a mixture of Regular and National Servicemen in approximately equal proportions. In all theatres of operations and stations overseas commanders have been unanimous in praising the conduct in action and morale of National Servicemen. Without National Service it is difficult to see how we could have met the many commitments which the Army has been called upon to face in the last two years. But any system of national service depends upon a solid framework of long-service officers and N.C.O.s. to provide the experienced leaders in units and instructors for training establishments. Herein lies our present weakness. There is a shortage of Regulars, especially in the ranks of middle piece officers and amongst N.C.O.s.

During recent months various measures have been introduced to increase

the intake of Regular officers. Financial inducements in the form of increased rates of pay and retired pay, tax-free terminal grants and technical pay have been sanctioned. A certain number of appointments in static headquarters have been thrown open to retired officers, and selected majors and lieutenant-colonels are being permitted to remain in the service up to the age of 55. These measures aim to offer a military career of length and security comparable to those prevailing in other professions, and to widen the basis of officer recruitment to cover those who through environment or education might not otherwise have given thought to making their career in the Army. In a further effort to fill the ranks permanent Regular commissions are being offered to ex-officers who have held either Regular or non-Regular commissions in the Army, Navy or Air Force. It is as yet too early to judge the effectiveness of these measures.

The seriousness of the situation was underlined by the Secretary of State for War (Mr. A. Head), who in introducing the Army Estimates in the House of Commons on March 10, 1952, stated :

We have in the Army to-day, I think, the best manpower the Army has ever had, and I cannot sufficiently stress the importance of having an adequate supply of good officers. Our need is for about 37,000. We have 33,500: so we have a deficiency of about 3,500. But this is the point: of the 33,500 whom we already have, only half are Regular Officers. The remaining half are either short-service commissioned or National Service officers. So we have a dual problem; it is to reduce the deficiency of officers as a whole and to increase the proportion of Regulars among them. (Hansard, Volume 497, No. 51, page 1033.)

The Secretary of State then went on to say that the Army needed an intake of 1,000 officers a year as against the present intake of about 580 a year from Sandhurst and 200 a year from National Service and the universities.

In dealing with the shortage of Regular other ranks Mr. Head revealed that the recently introduced short-service engagement of three years with the colours and four with the Reserve had met with an encouraging response. This type of engagement, however, can only be regarded as a temporary expedient, and the real problem is to find the long-service soldier. With this end in view the War Office now propose to amend the Army Act so that a man can join on an initial engagement of 22 years with the colours, and thereafter hope to re-engage until he reaches the age of 55. This proposal should go a long way to provide a long-term solution to the problem of providing our National Service Army with the necessary backbone of Regular long-service N.C.Os. and men. This problem is, and for some years past has been, mainly a two-fold one. Firstly, to provide the prospective soldier with financial inducements comparable to those obtaining in civil life. Secondly, to provide him with security of employment either in the Service itself or in civil life after discharge from the Service. The new pay and pension rates have gone far to provide the answer to the first part of the problem. The answer to the second part is in sight and indeed the problem is already partially solved, for the Secretary of State for War was recently able to tell the House of Commons that "I can assure the House and the Army that a man who engages on a long-term Service commitment is virtually almost certain of employment when he finishes." Unfortunately this remark cannot be made to apply to the ex-Regular officer, whose chances of employment on retirement are still meagre.

In April, 1951, the inflow of National Servicemen—on completion of their service with the colours—into the Territorial Army and Supplementary Reserve, which had been interrupted by the increase in colour service from eighteen months to two years, was resumed. The intake by February, 1952, had amounted to over 100,000, and it is satisfactory to note that of those posted to T.A. units over 25 per cent. have joined the T.A. as volunteers. In the case of S.R. units the response for volunteers has, however, been small.

The call-up of some 235,000 Class "Z" reservists for 15 days' training in the units of the Territorial Army, Anti-Aircraft Command and certain non-divisional Regular units proceeded on the whole smoothly last summer. Not only were the units themselves enabled to carry out training with adequate strengths and as a team, but the reservists were able to familiarise themselves again with the weapons and equipment they would handle in war and in the majority of cases in the actual units to which they would be posted on mobilisation. As already stated, a second call-up is to be carried out this summer involving some further 250,000 men; and in certain cases reservists who were called up last year are to be allowed to volunteer for a further 15 days' training this year. None will doubt that this annual call-up will materially advance the state of readiness of our Reserve formations in the event of mobilisation. But, assuming that at the Lisbon Conference the Government undertook to provide a quota towards the twenty-five or so reserve divisions which were promised to S.H.A.P.E. by the end of 1952 "in appropriate conditions of combat readiness" at 3 to 30 days after the outbreak of war, it is difficult to see how we could fulfil our obligations.

Compared with the Territorial Army the other main Army reserve, the Supplementary Reserve, is in bad shape. Out of an authorised strength of 100,000 men it contains at present only just over 6,000 volunteers. Considering that this Reserve provides the bulk of administrative and specialist units for both Regular and Reserve formations, some at any rate of which would be required immediately on mobilisation, the position is not one which can be regarded with equanimity. The importance of the Supplementary Reserve was emphasised last winter when, to meet the crisis in the Suez Canal Zone, Supplementary Reserve personnel were temporarily despatched to Egypt to augment the technical services.

On the subject of rearmament very little information has been released by the War Office. Production of the Centurion tank is known to be proceeding very satisfactorily, and delivery of soft vehicles already on order is about to start. Obviously the past 18 months or so have been taken up in the process of "tooling up" industry, and it is only in the coming year that the flow of finished articles of arms and equipment will commence. This is reflected in the Estimates for 1952-53, which include £157,000,000 for warlike stores as compared with £58,000,000 for the past financial year.

In summing up the state of the Army last year we stated that the broad picture was one of large manpower but relatively weak fighting strength available for immediate action. During the past twelve months progress has been made in welding the mass of trained reservists into the fighting machine, and the Regular Army has increased its front-line strength by three divisions. Much yet remains to be done, but the achievements of the last year should not be underrated. They are considerable.

THE .280-INCH CALIBRE RIFLE

On June 22, 1951, the War Office issued the following summary :

As the War drew to a close in 1945, the need to re-arm the Infantry with a light rifle of the self-loading type became increasingly evident. No lighter rifle could be produced if the .303-inch ammunition were to be retained, since the recoil on the shoulder when fired from a light rifle would be excessive. A new round, therefore, became the primary requirement.

This provided an opportunity to dispense with the rimmed case of the .303-inch ammunition which had been in use since the latter half of the last century. In the days before automatic weapons came into being a rimmed case was no disadvantage. For automatic weapons, however, a rimless case is most desirable to reduce the number of stoppages during firing and to simplify the mechanism of the gun.

In 1945, it was decided to appoint a Panel to report upon the best calibre, case, and bullet characteristics to permit the development of a self-loading rifle of as light a weight as possible. This Panel, after prolonged and extensive investigation, established that the .280-inch calibre was ideal for general use.

The characteristics of the .280 round permit a decrease of 12 oz. in the weight of the unloaded rifle. In addition, the .280-inch cartridge gives an 18 per cent. saving in weight when compared with the existing .303-inch round. There is also a substantial decrease in length which in turn provides a considerable reduction in bulk on large quantities of ammunition.

Following development work spread over three years, exhaustive trials have been carried out during the past 18 months with ammunition and semi-automatic rifles of .280-inch calibre. These show that :

- (a) The wounding power or incapacitating effect of .280-inch is ample to fulfil requirements and its powers of penetration at the limits of range are considerably better than those of .303-inch.
- (b) Despite these attributes the recoil produced when fired from the light rifle is substantially less than that of the .303-inch fired from the existing Service rifle.
- (c) The rate of aimed fire of the individual soldier will be at least three or four times greater than before.
- (d) The functioning of the new rifle is more dependable in adverse conditions of dust and mud, extremes of climate, etc., than that of any comparable weapon in use.
- (e) It is better than the present Service rifle when fired for accuracy at all Service ranges.
- (f) It is robust and will withstand the full rigours of fighting with the bayonet, and yet is considerably easier to handle than the existing Service rifle.

The decision to change the calibre of our ammunition and to introduce a new rifle into the British Army has been taken only after a detailed and careful examinations of the results of trials and experiments over the last five years.

In the autumn the new rifle was the subject of demonstrations to and discussions with other members of N.A.T.O., in particular the United States, Canada, and France, with a view to enlisting their support to its adoption as a standardised weapon. In the meantime the United States had likewise been working on the same problem since the war and had produced an improved version of their own .300 rifle with similar characteristics to our .280. Agreement with the Americans as to standardisation could not, however, be reached. Differences of opinion were centred mainly on the question of calibre, the Americans maintaining that their larger calibre provided the better penetration and stopping powers.

On December 11 the Prime Minister informed the House of Commons that pending further talks with the Americans, plans for re-tooling our factories for production of the .280 had been postponed. After Mr. Churchill's visit to Washington and Ottawa in January he informed the House that a decision had been made to go in for experimental production of the new .280 rifle. There the matter rests for the present. What exactly the term "experimental production" entails has not been divulged, but presumably it implies that small numbers of the rifles will be turned out so that in the event of a decision to go for full-scale production no time will be wasted and "teething troubles" will have been eliminated.

SENIOR APPOINTMENTS

The following appointments to the more important commands took place during the year on the dates given:

- Commander-in-Chief, British Army of the Rhine:* General Sir John Harding, K.C.B., C.B.E., D.S.O., M.C., A.D.C. (September, 1951)
- Commander-in-Chief, Far East Land Forces:* Lieutenant-General Sir Charles Keightley, K.C.B., K.B.E., D.S.O. (May, 1951)
- General Officer Commanding-in-Chief, Western Command:* Lieutenant-General Sir Cameron Nicholson, K.B.E., C.B., D.S.O., M.C. (September, 1951).
- General Officer Commanding-in-Chief, Scottish Command:* Lieutenant-General C. M. Barber, C.B., D.S.O. (February, 1952)
- Commander 1st Corps, Germany* (new appointment): Lieutenant-General A. D. Ward, C.B., C.B.E., D.S.O. (June, 1951)
- General Officer Commanding, East Africa:* Lieutenant-General A. M. Cameron, C.B., M.C. (October, 1951)
- Commander, 2nd Infantry Division:* Major-General B. A. Coad, C.B.E., D.S.O. (June, 1951)
- Commander, 7th Armoured Division:* Major-General C. P. Jones, C.B.E., M.C. (May, 1951)
- General Officer Commanding-in-Chief, British Element in Trieste:* Major-General Sir John Winterton, K.C.M.G., C.B., C.B.E. (March, 1951)
- Commander, British Forces, Hong Kong:* Major-General Sir Terence Aiery, K.C.M.G., C.B., C.B.E. (February, 1952)

THE WOMEN'S SERVICES

As part of the policy to extend the scope of employment for women in the Service a Staff College for the Women's Royal Army Corps was opened at Frimley Park, near Camberley on July 6, 1951. The College is designed to train officers for 2nd and 3rd grade staff appointments. Whilst the officer recruiting position is satisfactory, the intake of other ranks decreased by some 700 during the year. The War Office are now considering measures to enhance recruiting and amongst these are the opening of vacancies for women in the technical corps.

The strength of officers in Queen Alexandra's Royal Army Nursing Corps is still much below establishment, and it has been necessary to employ some civilian nurses in military hospitals to make up the deficiencies. The recently formed establishment of other ranks in Q.A.R.A.N.C.

is filling up satisfactorily and the first drafts were posted overseas in November, 1951.

March, 1951, marked the twelfth anniversary of the Auxiliary Territorial Service (A.T.S.), the predecessor of the Women's Royal Army Corps. The first awards of the Territorial Efficiency Medal were gazetted on March 16. As in the case of the Territorial Army the medal is awarded for 12 years' "voluntary, efficient and continuous service." Service in the A.T.S., A.T.S. (T.A.), and W.R.A.C. (T.A.) counts towards the award.

THE BRIGADE OF GURKHAS

The means of providing officers for the Brigade of Gurkhas, which have presented certain problems since the four Gurkha Rifle Regiments were transferred to the British Army in 1948, are now to be further widened by the granting of short-service commissions to British officers. These commissions will be for three years on the Active List and five years on the Reserve, with the prospect of Regular commissions for a small number of specially selected officers after a period of probation. Those eligible to apply for these commissions must have had previous experience, either as Regular or emergency commissioned officers, with Gurkha troops and have a knowledge of their language.

The important part played by some 10,500 troops of the Gurkha Brigade in the Malayan Campaign has received but scant notice in the press and in Parliament, but it is reflected in the periodic lists of awards for gallant and distinguished services. In addition to their traditional role as infantry, Gurkhas are now serving with Royal Engineers, Royal Signals, and other corps units.

THE MALAY REGIMENT

The Malay Regiment, which during the World War II comprised two battalions, has since the emergency been expanded to five active battalions, and a sixth is now in the process of formation. It is officered by British and Malay officers, the former being seconded. To meet the additional need for officers as the result of expansion, former officers of the late Indian Army are now being invited to apply for re-employment with the Regiment on short-service terms. Ex-regular officers will be allowed to retain their Indian Army pensions, including the compensation they received on termination of their careers in the Indian Army. The rates of special pay for service with the Malay Regiment have recently been increased.

BREVET PROMOTION

On the outbreak of war in September, 1939, the system of brevet promotion in the Army was suspended, and the wartime system of acting and temporary promotions introduced. On November 29 the War Office announced that brevet promotion to lieutenant-colonel had been re-introduced with effect from July 1, 1951. A number of such promotions have subsequently been gazetted.

HONOURS AND AWARDS

The award of the Victoria Cross to Private William Speakman, the Black Watch (The Royal Highlanders) attached 1st King's Own Scottish Borderers was announced in the *London Gazette* of December 25, 1951, for

gallant and distinguished services in Korea. This is the second award of the V.C. in the Korean War.

On November 4, 1951, at 0400 hours, 1st K.O.S.B. were subjected to heavy bombardment and subsequent attack by the enemy in overwhelming strength. Fierce hand-to-hand fighting ensued. At 1745 hours, hearing that the left sector of "B" Coy was overrun and that all the N.C.O.s. had been wounded, Private Speakman, who belonged to company headquarters, collected a large pile of grenades and six men. He led repeated charges with his party to restore the position. After the tenth charge he was wounded in the leg, but despite this he repeated the assaults and continued to do so until the company was ordered to retire at 2100 hours.

He was, by his heroic actions, personally responsible for causing enormous losses to the enemy, assisting his company to maintain their position for some four hours and saving the lives of many of his comrades when they were forced to withdraw from the position.

PRESENTATION OF COLOURS

On April 3, 1951, His Late Majesty King George VI presented Colours to the 1st and 2nd Battalions, Coldstream Guards, at Windsor Castle.

On May 25, 1951, The Princess Elizabeth, Duchess of Edinburgh (Colonel, Grenadier Guards), presented Colours to the 3rd Battalion, Grenadier Guards, at Buckingham Palace. The Princess subsequently attended the laying up of the old Colours of the battalion in Manchester Cathedral on June 21. Later in the same month H.R.H. The Duke of Gloucester (Colonel, Scots Guards) presented Colours to the 1st and 2nd Battalions, Scots Guards, at Edinburgh.

In July H.R.H. The Princess Royal, as Colonel-in-Chief of the Regiment, visited Austria to present Colours to the 1st Battalion, the West Yorkshire Regiment.

WAR MEMORIAL

At Calais on June 2, 1951, H.R.H. The Duke of Gloucester, Colonel-in-Chief, The Rifle Brigade, unveiled and Canon F. Ll. Hughes, the Chaplain-General to the Forces, dedicated the Green Jacket's War Memorial in honour of those men of the 2nd Battalion, King's Royal Rifle Corps, the 1st Battalion, The Rifle Brigade, and the 1st Battalion, Queen Victoria's Rifles (T.A.), who died in the defence of the town between May 23 and 26, 1940, when covering the retreat of the B.E.F. to Dunkirk.

OBITUARY

Field-Marshal The Lord Birdwood of Anzac and Totnes, G.C.B., G.C.S.I., G.C.M.G., G.C.V.O., C.I.E., D.S.O., D.C.L., LL.D., died on May 18, 1951, at the age of 85. Birdwood joined the 11th Bengal Lancers in 1886 and first gained distinction in the field as commander of the Australian and New Zealand forces at Gallipoli. In 1916 he was transferred to the Western Front, where, in turn, he commanded the 1st Anzac Corps, the Australian Corps and Vth Army. For his outstanding success in command of Australian forces, he was made an Honorary General in the Australian Military Forces. In 1920 he was appointed G.O.C.-in-C., Northern Command (India). Five years later he became C.-in-C., India,

and was promoted Field-Marshal. On his retirement from active employment, Birdwood was elected Master of Peterhouse, Cambridge, an appointment which he held with conspicuous success from 1930 to 1938.

The death of "Birdie" marks the passing of the last of the high military commanders of World War I. Their place in history is assured, and amongst them Birdwood ranks high. He is remembered with affection by all ranks, British, Australian, New Zealand, and Indian, who served under him.

THE ROYAL AIR FORCE

The strength of the Active Air Force on April 1, 1951, was just below 238,000 men and women. The estimated strength on April 1, 1952, was 270,000. The significant feature of this increase in strength lies in the influx of Regular recruits during the last twelve months. The intake amounted to close on 45,000 men, as compared with about half that number in the previous year.

The position as regards manpower is, therefore, now satisfactory, although it will, of course, take time before the requisite numbers of air-crew and skilled technicians are fully trained. When one considers the serious shortage of Regular personnel in the R.A.F. at the beginning of the year, it is of interest to examine the cause for this rapid improvement in recruiting. The main reason would appear to lie in the measures taken to improve the conditions of service. These include the new rates of pay introduced in 1950 and the more recent increases in retired pay and pensions, together with tax-free terminal grants; the agreements with the Trade Unions whereby approximately 90 per cent. of R.A.F. skilled trades are now recognised by unions; the introduction of 4-year engagements for aircrews and of 3- and 4-year engagements for ground trades; the new trade structure, with its prospect of a Service career up to the age of 55 in technician as well as N.C.O. grades; and the opportunities afforded to warrant officers and chief technicians to obtain Regular commissions as Branch Officers. These and other changes have contributed largely to the increasing popularity of the Service. Further proof of that popularity is to be seen in the large number of men registering for National Service who now ask to serve in the Royal Air Force, and who, if they are selected, subsequently transfer to Regular engagements. Yet another change in terms of service is now being introduced, under which youths of 17½ may engage for 3 or 4 years in ground trades, in addition to the normal engagements of 5, 10, and 12 years.

In contrast to the R.A.F., recruiting for the Women's Royal Air Force has shown no improvement during the past year, and still remains disappointing.

The main expansion in operational strength has taken place in the British Air Force of Occupation, which has now been renamed the 2nd Tactical Air Force, and in Fighter Command. The main equipment of these commands is still based on the Meteor and the Vampire, pending the production of newer types of aircraft such as the Venom, Swift, and Hawker P1047 (now named the Hunter).

In Bomber Command, the Canberra has now taken its place in two squadrons, and further squadrons are due for conversion during the year. pending the production of the Valiant (4-engined jet bomber) the medium

squadrons are equipped with Lincolns and Washingtons. Further squadrons of the latter have been raised in the past twelve months.

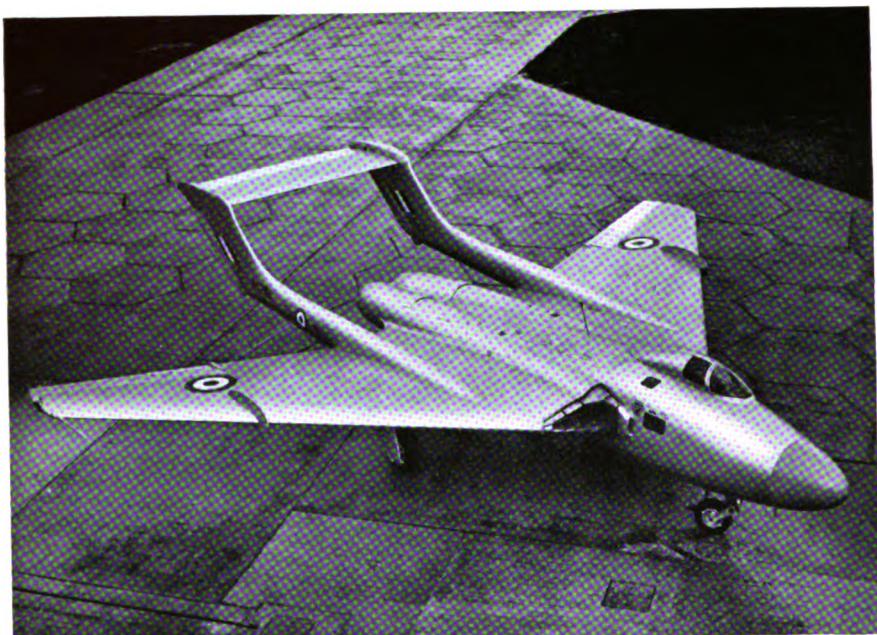
In recent months the first deliveries of Lockheed Neptunes have arrived from the U.S.A. for Coastal Command. This aircraft and the A. V. Roe Shackleton are destined to be the main equipment of the Command in the near future.

In Korean waters, R.A.F. Sunderlands have been continuously employed in support of the United Nations Forces. In Malaya, R.A.F. Brigand light bombers and Hornet and Vampire fighters have played an important role in the anti-bandit operation by carrying out air strikes against jungle camps and by acting in close support of the ground forces. In addition Dakotas have continuously provided the maintenance for patrols by air drop and the Helicopter Flight has proved invaluable in the evacuation of casualties from jungle areas. During October, 1951, Hastings of Transport Command and Valettes of the Middle East Transport Wing carried out large-scale movements of units, reinforcements, vehicles, equipment, and supplies to North Africa. These included the transfer of 19th Infantry Brigade from England to Libya, the move of 16th Independent Parachute Brigade from Cyprus to Egypt, and the evacuation of families from the Canal zone.

To compete with the influx of aircrew personnel, training facilities have been considerably expanded during the year; amongst these are three new basic flying training schools equipped with Chipmunk aircraft, and the revival of Nos. 25 and 54 (Flying Training) Groups. R.A.F. trainees are now undergoing flying training in Canada, and the first batch of pilots obtained their wings there in October. In Rhodesia the Air Training Group has been expanded by the addition of a second training school. During the summer months all twenty Royal Auxiliary Air Force squadrons carried out three months' continuous training with Fighter Command. All these squadrons are now equipped with jet aircraft. In addition several hundred reservists were called up for three months' intensive flying training.

Concurrently with expansion of the first-line strength of Fighter Command, steps have been taken to expand and improve the state of readiness of the control and reporting system. Last year some 7,000 Class "G" reservists were called up for 15 days' training with the regular and R.A.F.V.R. units employed on these duties, and eleven new flights of R.A.F.V.R. were formed to keep pace with the expansion of the system. Also some 4,000 Class "H" National Service reservists were called up for a similar period. In the coming year a further 5,500 Class "G" reservists will be called up.

Whilst much progress has been made in the expansion of the Royal Air Force on the personnel side, the equipment side is by no means satisfactory. This is particularly marked in the case of fighter aircraft, where deliveries of new types have lagged seriously behind schedule. In the meantime no squadrons are equipped with swept-back wing fighters comparable in performance to the United States F.86 Sabre and the Soviet Mi.G.15. In order to speed up production the Minister of Defence (Mr. Winston Churchill) announced in the House of Commons on March 5, 1952, that the Government had decided to give super-priority over other defence work and export orders to certain types of new aircraft most urgently



De Havilland D.H.110 twin-jet all-weather fighter



Douglas Skyrocket, 1200 m.p.h. at 63,000 feet; an all-rocket piloted prototype

needed to re-equip squadrons. The types included the Hawker Hunter, the Canberra, the Vickers Valiant, the Supermarine Swift, the Fairey Gannet, and either the de Havilland D.H.110 or the Gloster GA.5, whichever is finally selected for production. In addition a number of F.86 Sabres are being constructed in Canada for the R.A.F.

TRAINING

A series of large-scale air exercises took place at the end of September, 1951, in Western Europe. Of these the most important was "Cirrus," a defence exercise designed to test the fighter formations of Lieutenant-General Norstad's Allied Air Forces, Central European Command. Approximately 1,000 aircraft of all types took part, including 700 fighters, of which 95 per cent. were jets, belonging to the air forces of Belgium, Britain, Denmark, France, Holland, Italy, and the U.S.A.

The aim of the exercise was to employ as realistically as possible the system of command and control of all air and anti-aircraft forces in Western Europe, with special emphasis laid on arrangements made for mutual support. Particular attention was given to the problem of the integration of the control and reporting systems, more especially in the exchange of air information and the hand-over of fighters between the defending air forces as well as between those forces and the United Kingdom.

As the first large-scale test of the various forces engaged, the degree of co-operation and integration achieved was on the whole encouraging. In particular it showed that the difficulties of language had been overcome. Valuable lessons for the planning of expansion of the radar warning and communications systems were learnt. About the same period an exercise in the air defence of the United Kingdom was staged in which Fighter and Anti-Aircraft Commands were tested against bombers of Bomber Command and the U.S.A.F. bomber formations stationed in England and Europe, and against fighters of 2nd Tactical Air Force supported by Belgian and French squadrons.

SENIOR APPOINTMENTS

The following important appointments were announced, or took place during the year, on the dates given:

Inspector-General: Air Marshal Sir Thomas M. Williams, K.C.B., O.B.E., M.C., D.F.C., to be Inspector-General of the Royal Air Force (July, 1951)

Coastal Command: Air Marshal A. C. Stevens, C.B., to be A.O.C.-in-C. (June, 1951).

Technical Training Command: Air Vice Marshal V. E. Groom, C.B., C.B.E., D.F.C., to be A.O.C.-in-C. (July, 1952)

Transport Command: Air Marshal C. E. N. Guest, C.B., C.B.E., to be A.O.C.-in-C. (May, 1952)

Middle East Air Force: Air Chief Marshal Sir Arthur Sanders, K.B.E., C.B., to be A.O.C.-in-C. (May, 1952)

Far East Air Force: Air Marshal A. C. Sanderson, C.B., C.B.E. D.F.C., to be A.O.C.-in-C. (May, 1952)

Malaya: Air Vice-Marshal G. H. Mills, C.B., D.F.C., to be A.O.C. (December, 1951)

RESERVE FORCES

At a conference held at the end of November, 1951, to discuss questions arising from the three months' call-up of Royal Auxiliary Air Force fighter squadrons, the Vice-Chief of the Air Staff (Air Chief Marshal Sir Ralph Cochrane, stated that the standard of training achieved and the response of squadrons to the call-up had exceeded all expectations. Approval has been given for the raising of three new R.Aux.A.F. transport squadrons and a number of fighter control and radar reporting units. During the year eleven new flights of the Royal Air Force Volunteer Reserve were formed at Fighter Command control and reporting stations, and three more are due to be formed in 1952. Three R.A.F.V.R flights have also been formed for movement (embarkation) duties.

Previously it has been one of the functions of A.O.C.-in-C., Home Command, to advise the Air Council on all matters pertaining to the Auxiliary and Reserve Forces and the Air Training Corps. Recently, however, a new Directorate of Auxiliaries, Reserves, and Cadets has been set up in the Air Ministry, to take over these functions. Air Vice-Marshal W. M. Yool, C.B., C.B.E., has been appointed the first director. The A.T.C., however, will still remain under the command of A.O.C.-in-C., Home Command.

In the Women's Royal Air Force Volunteer Reserve a flying branch has recently been formed with the object of providing a reserve of women pilots for communication and ferrying duties.

EQUIPMENT

The Canberra medium jet-engined bomber is now in service with Nos. 101 and 617 Squadrons. A further number of Bomber Command squadrons are due to be equipped with them during the coming year. The first British four-engined jet bomber, the Vickers Valiant made its maiden flight in May. In September it was seen by the public in flight at the Society of British Aircraft Constructors' Display at Farnborough. The aircraft is powered by four Rolls-Royce "Avon" axial-flow turbo-jet engines, each generating a maximum of 12,000 h.p. at 600 m.p.h. Production orders have been placed for the R.A.F. Another 4-engined jet bomber on view at the S.B.A.C. Display was the Short SA/4, also powered with "Avons."

Night fighter squadrons of Fighter Command are now being equipped with the Vampire N.F.10 and Meteor N.F.11. Both these machines are adaptations of existing day fighters, and have been placed in squadrons as an interim measure until the de Havilland D.H.110 or Gloster G.A.5 delta-winged long-range fighters are ready for the Service. Yet a third interim type, the Venom N.F.2, is expected to take its place in squadrons later in the year.

PRESENTATION OF THE KING'S COLOUR

On May 26, 1951, H.R.H. The Princess Elizabeth, Duchess of Edinburgh, on behalf of His Late Majesty, presented The King's Colour to the Royal Air Force at a representative parade in Hyde Park.

H.M. The Queen, H.M. The Queen Mother, and other members of the Royal Family were present, together with the Air Council.

Before presentation The Colour was consecrated by the Chaplain-in-Chief, R.A.F. (Rev. Canon L. Wright). The Princess addressed the

Parade and read an address from His Majesty, whose illness prevented him from presenting the Colour.

On August 1, The Princess Elizabeth paid her first visit to the Royal Air Force College, Cranwell, where she was Reviewing Officer at the Graduation Parade ; and on August 4, at Leuchars Her Royal Highness presented the Esher Trophy to No. 603 (City of Edinburgh) Squadron, R.Aux.A.F., of which she is Honorary Air Commodore.

HONOURS AND AWARDS

The posthumous award of the George Cross to Flight Lieutenant J. A. Quinton, D.F.C., No. 228 Operational Conversion Unit, was announced in *The London Gazette* of October 23, 1951. On August 13, 1951, Flight Lieutenant Quinton was a navigator under instruction in a Wellington which was involved in a mid-air collision. The sole survivor was an Air Training Corps Cadet. Quinton and the cadet were in the rear compartment of the aircraft when the collision occurred. Quinton saved the boy's life by picking up the only parachute within reach, clipping it on to the boy's harness and indicating to him how to jump.

Quinton acted with superhuman speed, displaying the most commendable courage and self-sacrifice, as he well knew that in giving up the only parachute within reach he was forfeiting any chance of saving his own life.

D. A. L. WADE

CHAPTER III

THE NEAR AND MIDDLE EAST IN RELATION TO WESTERN DEFENCE

IN DEALING with questions of defensive planning on a Continental scale, it is clearly of vital importance to be precise in thought and nomenclature. Thus, when we speak of the Near and Middle East, we must be quite clear of what exactly we mean by an expression which is in itself vague. For example, on looking again at the article entitled "Western Defence" which he wrote in "Brassey's Annual" for 1951, the present writer has observed that he himself was guilty of using the term "Middle East" far too loosely. It is an all too common fault which must be most carefully avoided in this article if the argument is to be logical and clear.

When the North Atlantic Treaty Organisation first came into being, the region for which the Supreme Commander was responsible was divided into three areas, northern, central, and southern, of which the southern was based on Italy. Since the purpose of N.A.T.O. is to guard against the occurrence of a third world war by defensive preparation, it is clear that N.A.T.O. problems cannot be considered purely from the point of view of the northern, central, and southern areas; they must be seen in the wider aspect of the problems of adjacent portions of the globe. The purpose of this article is to link up the defence of the southern N.A.T.O. area with that of the land, sea and air further to the east.

This later area, like that of N.A.T.O. itself, falls into three parts:

- (1) The Balkans.
- (2) The Near East, comprising Asia Minor, Syria, Lebanon, Israel, Jordan, and Egypt.
- (3) The Middle East, comprising Iraq, Persia, and Arabia.

We have now established a precise definition, and the importance of this precision will become ever more clear as the argument proceeds. An important point at once emerges from the study of this definition. Turkey forms a connecting link between all these subdivisions.

The next point on which we need to clear our minds is the general strategic importance of these three areas purely from the geographical point of view. All three are deficient in communications. The Balkans, Asia Minor, and Persia are mainly mountainous and there is a considerable area of desert in Syria and between Israel and the Euphrates.

The geographical position of the Balkans places them on the flank of any major campaign for the mastery of Europe. They also lie in the path of an aggressor from western or central Europe who aims at the Near and Middle East. The old German imperial dream of *drang nach osten* is a case in point. On the other hand, if aggression comes from eastern Europe the occupation of the Balkans is only of importance to an aggressor for the purpose of protecting his left flank. The industrial and mineral resources of this area are not of major importance.

The Near East is the only path available to a European aggressor who seeks to penetrate into Africa by land. It is also one of two possible

routes from Europe to the Middle East, and if the eastern of these two routes be selected the aggressor must occupy the Near East to secure his right flank. As in the case of the Balkans, the industrial and mineral resources are not of great importance.

With this general picture in mind we now need to consider these three areas from the point of view of the defence problem which has brought N.A.T.O. into existence. It is a peculiar feature of the vast Russian dominions that they are singularly deficient in warm water ports except in the Black Sea. Moreover, it is only in the Arctic regions and on the western coast of the Pacific that they have direct access to the oceans. Control of the straits leading from the Black Sea to the Mediterranean has therefore been a Russian dream for generations. It is safe to say that this must always be a Russian objective, whatever political regime may be in power. Ever since the days of the Crimean War it has been a cardinal principle of British foreign policy to oppose Russian control of the straits. Only when battling for our lives against the Central Powers in World War I did we waver in this policy. To placate Russia and ensure her fidelity to the Triple Entente we then promised her control of the straits after the war. The revolution of October, 1918, released us from that promise because the Soviet regime concluded a separate peace with Germany. Our problem would be much more difficult to-day if Russian territory extended to the shores of the Ægean.

The Soviet Union, quite rightly from their point of view, fought World War II with a very clear idea of the situation which they needed to establish by the time it came to an end. Control of the whole of the Balkans was certainly a major point in this policy, with free access to the Mediterranean as a principal underlying idea. They were very nearly successful. But Turkey stood fast in her neutrality and Greece was saved from Communist domination by the narrowest of margins. As a result, we now see Turkey and Greece as members of N.A.T.O. This of course is a geographical absurdity; but to Greeks and Turks, thinking only of their best chances of security, geographical considerations are of secondary importance. What they feel they need is to shelter under an umbrella of collective security, and it seems to them that the best umbrella on the market at present is N.A.T.O., especially in view of the Truman doctrine of aid to all countries bordering on U.S.S.R.

The importance of the Balkans may thus be summed up as follows:

- (1) From the Russian point of view they mean access to the Mediterranean.
- (2) From the N.A.T.O. point of view their occupation gives security to the eastern Mediterranean and forms a threat to the left flank of an advance across Europe from east to west.

Two routes lead from Europe to the Near East: one through the Balkans to the Dardanelles, Sea of Marmora, and Bosphorus, and thence across western Anatolia; the other through Georgia and Armenia into eastern Anatolia. Neither route is an easy one topographically, and both are deficient in communications. If the problem is considered simply in the light of the features marked on any map of the area, it appears that the defence has a strong advantage from this point of view. It is, however, certain that any such advance would be preceded by an intensive campaign

of political warfare on cold war lines, which might seriously hamper the defence. Even without any special efforts in this direction the present difficulties in regard to Egypt and the occupation of the Canal Zone and the *malaise* of the Arab world in regard to Israel would prove a serious handicap.

Indeed, the importance of Egypt to any system of Balkan and Near and Middle East defence is obvious. It is even more important if the defence has command of the Mediterranean, as it is reasonable to assume will be the case in any future conflict. If, with Cairo as centre, we describe an arc with a radius of 1,800 miles the circumference will pass through Trieste, enclose the Balkans and the Caucasus and the southern shores of the Caspian Sea. Geographically Egypt is thus the perfect base for a campaign to establish the security of the Near and Middle East. It must not be forgotten that the security of the Suez Canal likewise depends on the success of such a campaign.

A campaign directed against the Middle East would have as its main objectives the Iraq and Persian oilfields and access to the Persian Gulf. These objectives might well be as attractive to the Soviet Union as control of the straits and direct access to the Mediterranean. It is clear, however, these two groups of objectives are divergent. The former involves movement in a south-easterly direction, the latter movement south-west. These facts lead to the inevitable conclusion that the defence of the Middle East is an entirely separate problem from Western defence. N.A.T.O. cannot be stretched further to the east than its present extension to include Turkey.

The argument has now been carried to the point where we can draw the conclusions upon which the remainder of this article must rest. They are :

- (1) The Balkans are primarily a problem of European defence, to maintain the security of the eastern Mediterranean and to threaten the left flank of an advance across Europe from east to west.
- (2) If the first of these two objects is achieved and the approaches to the Suez Canal secured, the Balkans exercise an important indirect influence on the defence of the whole of the Near and Middle East. If the second object is achieved, one of the routes from Europe to the Near East is barred.
- (3) The Near East cannot be divorced from the Balkan defensive problem, because Turkey is inevitably involved in both.
- (4) The Middle East is a separate problem and need not be further considered in this article.

The above four conclusions represent the bare bones of the problem which is posed by the admission of Greece and Turkey to N.A.T.O. by their insistence on being brought within the orbit of the Supreme Allied Commander in the West, and by their refusal to agree to form part of some newly created command.

If we look at the map it is at once apparent that the N.A.T.O. foothold in the Balkans is by no means firm. From Salonika to the shores of the Black Sea, a distance of some 300 miles, the strip of European territory in the hands of Greece and Turkey is nowhere as much as 100 miles wide. Turkey, of course, has her hinterland of Asia Minor behind her to fall

back on, but Greece is completely in the air and presents difficulties which were clearly demonstrated in 1941.

The situation of the other Balkan nations now needs to be considered. Bulgaria and Roumania are completely under Soviet domination; though, certainly in the case of Roumania, it is probable that the present regime is far from popular with the people. Yugoslavia is faithful to Communism, but not to the Soviet Union. Independence of outlook has always been an outstanding characteristic of the Yugoslavs and particularly of the Serbian branch of the race. The *coup d'état* of 1941, which overthrew the Government which signed the Axis Pact and altruistically plunged the country into the war regardless of all consequences save honour, afforded a clear demonstration of this fact. But if the national independence of outlook has led to Yugoslavia throwing off the shackles of a Russian satellite, it of course will equally recoil from any sort of dependence on the Western Powers. What part she would play in another European war it is hard to say. There remains Albania, a satellite cut off from direct communication with its controlling power and ruled by a government only too anxious to be subservient to Russia, but probably as unpopular with the people as that of Roumania. She is hardly likely to be able to exercise much influence on the course of events in any future war.

How then is the Supreme Commander to solve the problem presented by the addition of Greece and Turkey to his already overwhelmingly heavy responsibilities? The two countries are, of course, adjacent to the southern of the three areas into which his command has been divided. This area is commanded by an American admiral and has an Italian general as commander of its land forces. The British Mediterranean Fleet is another operative force in the neighbourhood, but is not under the command of the American admiral aforesaid.

It is clear that command of the air will be of vital importance, and that Anatolia is the only considerable area for the establishment of the necessary airfields. Assistance can only reach Greece by sea or air, and thus command of the Mediterranean as a whole is vital to any Balkan operations. The dependence of both Greece and Turkey upon outside assistance for the armament and equipment of their forces does not make the problem easier. The Turks can put nineteen divisions into the field, the Greeks ten divisions. American aid has greatly improved the resources of the Turkish Army, but a steady flow of supplies from the West would be necessary if it was to retain full efficiency in a campaign. The Greek Army is still very ill-equipped and needs much assistance in this respect. Both are well trained and have good fighting records. As this article was being written it was announced in the Press that the system of promotion in the Turkish Army had been remodelled. Hitherto it had been a very stagnant stream; 52 was the youngest age at which anyone could hope to reach the rank of brigadier. Under the new system brigadiers of 40 may be expected—a great improvement. Both Turkey and Greece would need considerable support in the air if superiority in that element is to be established.

Allowing for the fact that the bulk of the Turkish Army would of necessity be deployed on the Caucasus front, it thus appears that the start of a future war may see a force of fifteen to twenty divisions deployed along the frontiers of Greece and Turkey from the Adriatic to the Black Sea—

supported, it is to be hoped, by an adequate tactical air force. These forces will come under the Commander of the Southern Area of the Supreme N.A.T.O. Command. No difficulty arises from the fact that the Southern Area Commander is an American admiral; but his land forces commander is an Italian general, and it is quite certain that neither Turkey nor Greece would be prepared to place their forces under an officer belonging to a race which they regard as one of their hereditary enemies. Moreover, how could a commander established in the Italian peninsula to control campaigns in Thrace, Macedonia and the Caucasus; and how is responsibility for the command of the sea in the Mediterranean to be divided between the Commander Southern Area N.A.T.O. and the Commander British Mediterranean Fleet—which is independent of him and has special responsibilities in the eastern Mediterranean, an area in which the Americans have hitherto shown little interest or inclination to interfere? These dilemmas are a good example of the difficulties which beset any alliance based on Western theories of democracy. No such difficulties beset alliances based on the theories of so-called "peoples' democracy." In such a case the satellites merely do as they are told and are commanded by leaders from the forces of the major Power.

It is unwise for armchair strategists to suggest possible solutions to these problems. They can only be in possession of a bare outline of the factors involved, whereas, if by accident they hit on the right answer, they may prematurely divulge a secret.

If one looks at the map with the problems of a possible Balkan campaign in mind, the immense importance of Yugoslavia is at once apparent. If Yugoslavia adheres to the West, the Italian and Balkan theatres are automatically joined up and any advance through Bulgaria on Turkey and Greece becomes a dangerous operation threatened on its right. On the other hand, if Yugoslavia adheres to the East, Greece finds herself in a very dangerous position. The independence of outlook which is such a strong characteristic of the Yugoslavs has already been stressed in this article. Geographically they are so placed as to be a possible thorn in the side of either West or East, and it seems likely that they would make use of this bargaining weapon in an endeavour to get both sides to support their aspirations in regard to Trieste and Carinthia and perhaps to make further demands. It would seem most unwise for either side to count on their support. Nothing, however, is more likely to impress the Yugoslavs favourably than a picture of Western strength in Greece, Turkey, and the Near East.

Altogether, it is quite clear that it is worth while to make supreme efforts to overcome the difficulties mentioned above: to establish a sound system of command and confront every possible aggressor with a well-organised and equipped force of fifteen to twenty divisions with adequate air support and secure communications, deployed on the northern frontiers of Greece and Turkey and supported by strong forces in the Near East. What a useful deterrent this would be to any possibility of war! Moreover, it seems that it could be achieved with comparatively economical use of Western manpower. One inherent weakness must, of course, always remain—the lack of depth in the Greek portion of the front. Of course, this could in theory be corrected by a successful advance at the start of the campaign; but this is a contingency which is too much

to expect from a Western democratic alliance, ever handicapped in preparations for war during peace and never likely to be the aggressor in any war. This disadvantage might, however, be to some extent neutralised by latent hatred of "peoples' democracy" among the inhabitants of Bulgaria and Roumania. But how immensely the whole situation is improved if a firm bastion is established in the Balkans! The Mediterranean becomes a N.A.T.O. lake, the short sea route to the Near and Middle East is made safe, and the security situation in the Near East is immensely strengthened. Entry to the Near East via the straits is barred and an aggressor must advance via the Caucasus, a much less favourable route.

If, on the other hand, we fail to establish a secure bastion in the Balkans, the Greek tragedy enacted in 1941 would be repeated and the Turkish forces in this area would be forced to withdraw into Asia Minor and link up with the campaign in the Near East. This fact reveals a definite weakness in the command set-up. The Turks insist on coming under the Supreme Commander N.A.T.O. We have already seen that the assumption of responsibility up to the shores of the Black Sea adds immensely to his difficulties. Is he also to be responsible for the Turkish forces in the Caucasus? If so, how will this situation be co-ordinated with Middle East Command? It is surely clear that much rearrangement of responsibilities is bound to come in the future when hard facts come into conflict with national desires.

The responsibility for the defence of the Near and Middle East as defined at the beginning of this chapter rests with Middle East Command, except that this Command has no responsibility in regard to Turkey. Its main concern is therefore to meet aggression entering the Middle East via the northern frontiers of Persia, a country not allied to us in any way. As has already been stated, it is certain that any such aggression would be preceded by an intensive political offensive of the type commonly called cold war. The arbitrary artificiality of the frontiers of most of the countries in the Near East tends to make this task comparatively easy. But whatever may be the problems and difficulties of Middle East Command—surely it should be renamed Near and Middle East Command, since its responsibilities extend from the frontier of Tunisia to the frontier of Persia—they cannot be allowed under any circumstances to gravitate to the already over-full hands of the Supreme Commander N.A.T.O. To get drawn into them further than this very brief outline would therefore be to go beyond the terms of reference of this article. But it remains clear that Turkey stands in danger of falling between two stools and that much hard thinking is needed if confusion is to be avoided in war.

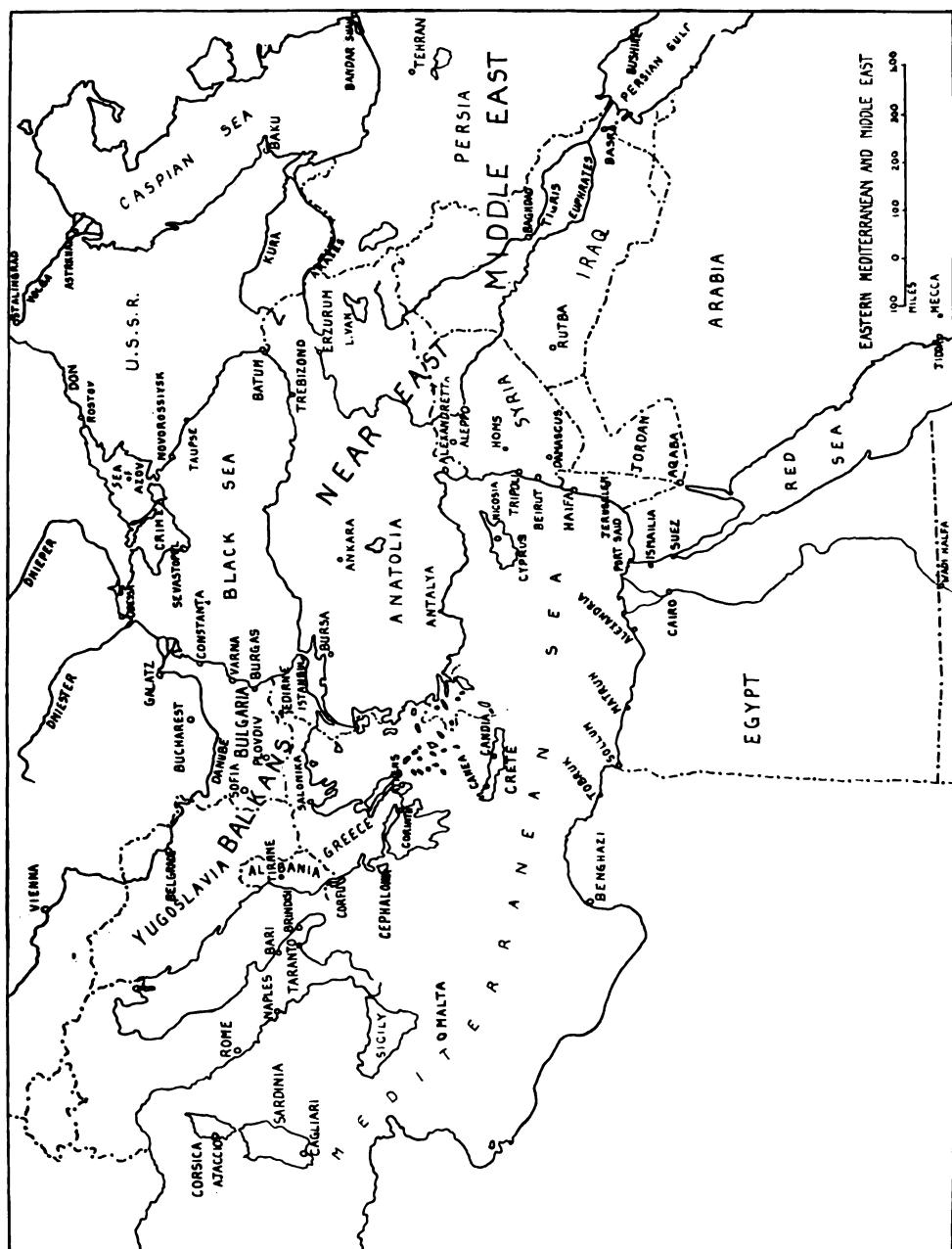
In conclusion, four main points seem to emerge from the above examination of the problem :

- (1) The Supreme Commander N.A.T.O. already has an over-full plate, and some further reorganisation and decentralisation of his command would seem to be inevitable in the future. In any case, it is quite certain that the Turks and Greeks will not agree to place their Armies under the command of an Italian, though they would be content to be under the American admiral commanding the Southern Area.

- (2) The Balkans can be of great importance both to Western European and Near East defence. In Turkey and Greece we have a foothold there. If we can retain it the security of the eastern Mediterranean is assured.
- (3) Arising out of (2), it is in our interests to strengthen Greece and Turkey as much as possible and particularly to ensure that they have adequate air support. Air bases in Anatolia also form a formidable threat to the oil resources of U.S.S.R.
- (4) Yugoslavia may almost be described as the key to the Balkans. Were she to be in the Western camp the task of an aggressor aiming at the straits and the shore of the *Æ*gean is made much more difficult. It is unlikely that she will take the same line as Turkey and Greece and apply for membership of N.A.T.O. Her policy will probably be to maintain an independent attitude, avoiding definite commitments. In the event of war, her hope will be to play whatever part appears most likely to further her own interests, and she will not want to be on the losing side.

This article was of necessity completed at the end of April. By the time it is published much water will have flowed through the Dardanelles and the Bosphorus. Perhaps satisfactory answers may have been found to some of the questions which have been posed. In itself it can do no more than present the bare bones of the problem.

E. H. WYNDHAM



CHAPTER IV

WAR BY PROXY

SINCE THE end of World War II the world has witnessed a number of armed struggles of Communist inspiration. These struggles include the prolonged conflict in Greece since 1944, risings in Azerbaijan and Kurdistan in 1945, the Chinese Civil War, the Outer Mongolian attack on Sinkiang in 1947, Korea, the war in Indo-China, and guerrilla and insurrectionary activities in Malay, Burma, and the Philippines. All have been linked more or less demonstrably with Moscow. All have injured the West more or less seriously. All have served the ends of Soviet policy. These conflicts may be called wars by proxy. They are *wars*, and not just bandit activities, because they have all had organisation, direction, and political purpose, and have not been mere marauding forays. They are wars *by proxy* because Soviet armed forces have not been openly and formally engaged at all. Historical parallels are hard to find. In their essential military character these conflicts have been diversionary operations which have sapped, disorganised, and confused the West. Taken together, they present a problem which has hitherto defied solution, a challenge which the best efforts so far made have not successfully met.

Wars by proxy may occur through insurrectionary risings inside a state or through the invasion of non-Communist territory by organised Communist forces. The Chinese Communist revolution is the classic example of the former; the North Korean attack on South Korea a model of the latter. Insurrectionary risings may receive help from adjacent Communist-controlled territories, as in the case of Indo-China and Greece; or they may do their best on their own with resources locally available, as in Malaya and the Philippines. Two factors are nevertheless common to all Soviet wars by proxy: all of them imply the general pattern of Communist world revolution; and all have their place in, and are finally governed by, the major scheme of Soviet strategy.

The social and political situation in which Communist insurrectionary risings become possible goes back in recorded history for at least 3,000 years. Many of its elements are described or implicit in the Old Testament narrative of David's rebellion against Saul (1 Samuel xxii, 1, 2; xxiii, 14): "David . . . escaped to the cave Adullam . . . and every one that was in distress, and every one that was in debt, and every one that was discontented, gathered themselves unto him; and he became a captain over them: . . . And David abode in the wilderness in strong holds, and remained in a mountain in the wilderness . . ."

The essentials of this situation are clear. There must be leaders who are members of, or make their way to, the directing class of their society; who may, or may not, include an outstanding personality; but who reject, or are rejected by, the rest of the group to which they properly belong. There must be a social and economic situation in which poverty and distress reach a level where significant numbers have less to lose—and may have more to gain—by abandoning their place in the social hierarchy than by remaining in it. There must be a region where such men can gather with

a fair chance of resisting destruction by the forces of established authority, where they can find arms and maintain themselves from local resources, and from which they can sally forth to attack, wear down, and hope ultimately to destroy, the existing regime. The authority established for the time being must be too weak to overpower the rebels or conquer the region which they dominate. The causes of discontent must include other elements besides poverty and insecurity and personal ambition in order that the struggle may not appear as a mere contest for power in which none save the participants are directly concerned. A sense of injustice must therefore be present, or some generalised resentment against inferiority, or some hostility to men of another race, colour, or faith. Last, but by no means least, there must be rallying ideas on each side which reinforce the brittle bonds of resentment, discontent, and ambition with larger loyalties that engage men's hopes and fears, and command the discipline and the will to self-sacrifice without which no great cause can be won.

Struggles of this kind are political struggles. Their prime characteristic is that the resolution of deep and organised differences of a political nature is sought not peacefully but by the organised use of force. The most important—and the most intractable—feature of Communist insurrectionary wars is thus not that they are Communist, but that they are political, and that they therefore belong to a type of contest which throughout history has usually been self-renewing, prolonged and bitter, and often ruthless in the extreme.

In the Communist insurrectionary wars of the past three decades the most important features of the internal situation have been agrarian and middle-class discontent, nationalism, and political weakness. The influence and combination of these factors has naturally varied from country to country. In China great agrarian poverty has existed for centuries, its ultimate, age-old, and ineradicable cause being intense pressure of population on too little cultivable land, and has created the multitudes of landless workers or impoverished peasants from whose ranks the fighters in unnumbered peasant rebellions have sprung. The Red River delta of Indo-China is another area where population pressure is severe in relation to land and food supply, and where peasant discontent is endemic. In parts of the Philippines agrarian discontent is also deep-seated and bitter, though here the existence of large, commercially run estates and the system of land-tenure are contributory factors.

Middle-class discontent is of two principal kinds—one which results from opportunities too restricted in number or reward for the candidates who seek them or feel that they have a right to do so, and another which is the consequence of foreign rule or foreign-controlled enterprise. Both Greece and China, each with a numerous educated and middle class but with opportunities restricted by poor national economies, are examples of the first kind; Burma under British rule, and Persia while the most important economic undertaking in the country was in foreign hands, are examples of the second. That in suitable circumstances both kinds of middle-class discontent interact and reinforce one another is obvious; Persia illustrates this among lands which have been the scene of Communist wars by proxy, as do India and Egypt among countries which have so far remained free from this scourge.

Middle-class discontent due to inferior status in relation to foreigners is

only one expression of Eastern nationalism, the growth of which in the past half century has been one of the major factors in the world situation. The main causes are independent of Communism—though Communists have played an important if hitherto little-remarked role in fomenting and fostering local nationalisms, accelerating their growth, and making more or less successful use of their dynamic and disruptive power. In countries which have suffered Communist insurrectionary wars, nationalism has been a salutary influence in Greece (and so far, paradoxically, in Indonesia); it has been negligible in Malaya and the Philippines; in Persia its expressions have largely neutralised one another, a deeply cherished tradition of independence and still powerful conservative religious groups hitherto offsetting other disruptive effects; while in China its elemental political force has been captured by Communism, and in Indo-China and Burma the outcome of its operation still hangs in the balance.

Where nationalism has proved favourable to Communism, its aid has been given indirectly—and often unwittingly—through the political weakness to which it frequently contributes. Political weakness is indeed the supremely important factor without which Communist insurrectionary wars would be impossible. Its causes are numerous and deep-rooted, and stretch far into the past. They include a perennial desire to prevent the growth of a strong central government which would bring powerful sectional interests under control or impose tax or military burdens that might prove onerous. Except Persia and China, and to a less extent Greece, the countries which have known Communist insurrectionary wars have never been strong unified states throughout history, nor have they developed the closely articulated social structure and national traditions upon which political and (given the requisite resources) military strength depends. Even in Persia, China, and Greece forces making for division, disorder, and political weakness have been constantly at work throughout the centuries, and have been successfully checked only in the intervals when strong governments have prevailed or when their legacy of cohesion and administrative vigour has overborne inherent tendencies to division and feebleness. It is of the utmost importance that those responsible for Western policy should realise these facts, for in the effort to combat Communism no error can have more far-reaching or more disastrous consequences than the wholly mistaken belief that strong centralised rule belongs to the nature of things, or that it can be easily and universally established, or that the harassing problems which political weakness imposes on the politically strong can then be comfortably left to others to solve.

To these underlying influences favourable to Communism other factors have been added which are due directly to World War II and to the policy of Britain and the United States.

In all the countries where Communist insurrectionary wars have occurred the events of World War II weakened or shattered the structure of established government. This was as true in Persia, where Reza Shah Pahlevi was forced to abdicate and the Soviet-occupied northern provinces were cut off from the rest of the country, and in China, where the struggle against Japan enabled the Chinese Communists to bring constantly increasing areas under their control, as it was in Greece, which lay prostrate under German occupation, and in Indo-China, Burma, Malaya, Indonesia, and the Philippines, which were all overwhelmed by Japan. Not less

important in South-east Asia than the material consequences of defeat were the permanent loss of prestige suffered by the former white rulers of these lands through their overthrow by the Japanese, the stimulus which local nationalisms received from the fact of victory by another Asiatic people, and the fostering of independence movements by Japan, when the tide of war began to set against her, as a deliberate long-term policy which would inure to her advantage in the future.

Britain's support of resistance movements during the war carried further this fatal tendency to weaken the structure of post-war government. The entire policy of creating and aiding such movements as a diversionary operation of war urgently needs objective review to determine whether, and in what circumstances, its transient benefits can ever outweigh its lasting dangers. During World War II the items on the debit side were certainly heavy. Not least among them were the opportunity and favourable conditions provided by these movements for sowing the dragon's teeth from which sprang a wide network of Communist organisations skilled in sabotage, practiced in guerrilla warfare, and ready to coalesce at any suitable moment into a major threat to the State. The loss of Greece to Communism in a campaign prepared and carried to an advanced stage during the resistance was averted at the crucial instant only by armed British intervention and short but violent fighting in December, 1944; the Communist tares sown during the war years were not finally rooted out until the Greek civil war ended in 1949 with victory for the West; while in Malaya and Indo-China the same tares sown by the same policy during the same years still flourish.

Even more potent in contributing to the political weakness which is an essential pre-condition of Communist insurrectionary wars was the British and American anti-colonial policy followed after 1945. In the case of Britain, although discreditable elements were not absent, this policy had the merit (so far as territories under the Crown were concerned) of applying to lands for which Britain herself was responsible, and of carrying out the self-imposed and noble ideal of conferring self-government upon peoples to whom it had long been promised. American anti-colonialism, on the other hand, was misconceived, to say the least; nor can political realists—or even those who salt their idealism with common sense—find much to praise in either British or American post-war policy towards Dutch rule in Indonesia or French rule in Indo-China.

Agrarian and middle-class discontent, Eastern nationalism, and political weakness create conditions in which armed risings, rebellions, and guerrilla warfare are always possible, and may even be endemic on a small scale; they do not account by themselves for the long and formidable series of Communist insurrectionary wars which the world has experienced since 1945 (and, in the case of China, since 1927). The specific and indispensable Communist contribution to these wars can now be defined. It comprises seven main elements—a legend, opportunity, leadership, discipline, technique, and a varying measure of outside direction and foreign support.

The adaptation of the Communist legend to Asiatic peoples has been strangely neglected. To attempt here the special study which is urgently needed would lead too far afield. What is certain is that the refinements of Communist theory have little practical relevance. The important constituents are on the one hand those elements of the legend which focus

resentment, hatred, and envy on the individuals and groups which Communism must destroy if it is to seize power, and on the other hand the nebulous but seductive promise of gain, advantage, and revenge which it holds out to the discontented generally. Not less important in their dynamic effects are the opportunities which Communism offers to those who join its ranks and win and hold its approval. These opportunities result from the fact that Communism is a truly revolutionary movement, which means that it seeks to replace one minority enjoying the possession and rewards of power by another minority chosen, not by birth or position, but by the will and ability to win power, and by success in doing so. From this standpoint Communism may be described as the twentieth-century counterpart of the Napoleonic doctrine that every soldier carries a marshal's baton in his knapsack.

Communism provides leadership not only by self-selection in a fiercely competitive struggle, but also by seeking out and training suitable recruits. Moscow has made great efforts to this end for over thirty years, establishing in 1921 the Communist University of Toilers of the East, and also the Far Eastern University (also known as the Sun Yat-sen or Chung Shan—Sun Yat-sen's honorific name—University) with a capacity of more than 1,200 students a year, as well as the Lenin Academy—which is apparently restricted to the ablest and most promising Communist leaders alone—at a date unknown. Despite their name of "university" or "academy," all these bodies are in fact places for advanced study and training in the strategy, tactics, and technique of subversion and revolution.

By now the strictness of Communist discipline is well known, even outside Communist circles. In a complex and most difficult undertaking such as revolution even in one country—to say nothing of world revolution—the value of that discipline is obvious. What is perhaps not so widely appreciated is the contribution which discipline makes to the great internal strength of Communism. No less important as a subversive factor is the Communist development of the technique of revolution. Here the outside world can easily err if it attempts to appraise the development of this technique solely by the statements on the theory of revolution contained in the classics of Communism. The published theory is not negligible; on the contrary, though clearly incomplete, its broad indication of the processes by which revolutions can be made is penetrating and in many respects true. But what is published can be only a part of what is known. There must be a large corpus of esoteric doctrine strictly confined to a select inner circle. Much of that doctrine may well consist less of general propositions than of detailed directives for use in particular situations. Any lack of generality would, however, not necessarily—nor even probably—lessen the pragmatic effectiveness of directives, the development and adaptation of which to a changing world situation must be one of the most difficult tasks of the supreme leaders of world Communism. But that such a corpus of doctrine and of temporally and politically limited detailed directives exists and is constantly being developed for fresh application is all but guaranteed not only by what is known of the working of world Communism, but also by the truth (and boast) proclaimed repeatedly by Communist leaders from Marx, Lenin, and Stalin downwards that Marxism is not a dogma but a guide to action.

Until the Communist victory in China in 1949, outside direction and

foreign support for Communist insurrectionary wars had to be Soviet in origin. Since 1949 either the Kremlin or Peking can provide such help—or, of course, the Kremlin via Peking. That no Communist insurrectionary war would be launched without at least Soviet approval is assured by the entire structure of world Communism, by the published constitution of the Comintern (only the façade of which was dismantled in 1943, leaving the main organisation working as before), by the unshakeable grip which the principle of "democratic centralism" enables the Kremlin to maintain on all major Communist action in every part of the world, and by the fact that Moscow unfailingly denounces any men or conduct of which it does not approve. But although these facts indicate the general nature of the relationship, few matters are harder to establish in satisfactory detail than the amount and character of Soviet (or Chinese Communist) direction and support that Communist insurrectionary wars have actually received. In the cases of China, Persia, and Greece no real doubt exists, though many vital details are not known. In Indo-China the Viet Minh has a Moscow-trained leader and receives support from China both in troop-training and in arms and supplies; latterly (May, 1952) some Soviet weapons appear also to have arrived on the scene. In Indonesia an almost classic instance of Soviet direction occurred in 1948, when an Indonesian Communist leader named Muso (or Moeso, in the Dutch spelling) returned after two decades of exile in the Soviet Union. He at once took over leadership of the Indonesian Communist Party. Soon afterwards, in September, 1948, a rebellion inspired and led by the Communists and supported by other Left-wing groups and leaders broke out in Surakarta (Soerakarta) and Madiun (Madioen). By early November it had been decisively crushed. On this occasion Moscow was badly informed about the local constellation of forces; but its part in this abortive rising could hardly be proved more conclusively by documentary evidence. In the cases of Burma and Malaya our knowledge is more slender; but here also Moscow's instructions may be confidently assumed to have a part in launching guerrilla warfare. In the Philippines the use by the Hukbalahaps of the Communist term "People's Liberation Army" (or its Tagalog abbreviation, HMB) and their references to a "New Democracy" are among the evidence that establishes their connection with Moscow—and very possibly also with Peking—for any one familiar with the present situation and policy of world Communism.

So much for the political characteristics of Communist insurrectionary wars. Organised Communist invasion of non-Communist territory—since the end of World War II the two examples to date are Korea, and the Mongolian attack on Sinkiang in June, 1947—is politically much simpler. In both cases the countries invaded were politically and militarily weak. In both cases strong Communist forces were available, Soviet-organised, Soviet-trained, and Soviet-armed. Organisation of such forces is indeed one of the earliest Communist acts on taking over a new territory. The Sinkiang incident was not sufficiently important to the West for the course of events to be established in detail, and the story quickly faded out of the news. In this affair, however, as in Korea, Soviet propaganda used an identical technique, and did its best to throw on the victims the responsibility for its own aggression.

All Communists' wars by proxy have their place in the grand strategy of

Communist world revolution as that strategy is laid down from time to time by the Kremlin. Sometimes, it is true, we know too little to determine the place of particular episodes in the general scheme; sometimes, even a measure of the tactical significance of individual moves can be discerned.

As in the case of Hitler, the Soviet attack on Greece by means of the Greek civil war aimed primarily at expelling the West from their last outpost in the Balkans and securing Communist control over the eastern Mediterranean. In addition, a Communist-dominated Greece would outflank Turkey to the west, dominate the approaches to Istanbul through the Aegean, and bring almost irresistible pressure upon the northern flank of the Straits. Intensification of the Greek civil war in 1947 aimed partly at stultifying the Truman and Marshall Plans by preventing Greece's economic recovery and military revival. The termination of the civil war in 1949 was due largely to the Yugoslav defection, and to the difficult tactical situation created for Communist guerrilla forces in the Greek northern frontier areas when Yugoslav territory could no longer be used for retreat, rest, and reorganisation, and when the loss of Yugoslavia cut land communications between the other Soviet Balkan satellites and Albania.

The Azerbaijan and Kurdish risings of 1945 also had far-reaching strategic aims. They prepared the way for a Communist *coup* in Persia, and therefore for Soviet expansion towards the Persian Gulf; if successful, they would have enabled Turkey to be outflanked from the east and opened the classic invasion route from Persia via Tabriz and Bayazit (thus making possible a two-pronged attack on the key position of Erzerum—the other prong being the no less classic Russian invasion route Leninakan—Kars—Erzerum); in conjunction with the Communist attack on Greece they threatened to cut off Turkey from Western aid except via Alexandretta and the difficult communication routes northwards across Anatolia. It would appear that the Azerbaijan and Kurdish risings were called off because in 1946 the Kremlin felt that it had not yet exhausted all possibilities of peaceful expansion, and because the next phase of Soviet strategy was not yet prepared.

China has obviously been a major Soviet preoccupation from the October Revolution onwards. Two examples will suffice to show the response of Chinese Communism to major decisions of Soviet world strategy. The first was the reversal of the all-out Chinese Communist attack on the Kuomintang after the Seventh World Congress of the Comintern in 1935, and the subsequent and successful effort to achieve a Chinese "united front" against Japan. This policy suited Soviet requirements by diverting Japan from Siberia and plunging her into the morass of major war with China. The second was the Soviet decision to hand over Manchuria to the Chinese Communists in 1945 and 1946, a decision from which the defeat and overthrow of the Chiang Kai-shek régime ultimately followed. This decision was taken despite its inevitable and foreseeable immediate consequences for Soviet relations with the West; though it should be added that the Kremlin's calculation of the gains which this step would bring have so far proved only too well founded.

The Mongolian invasion of Sinkiang in June, 1947, has a much smaller place in Soviet strategy. There are two possibilities. Either it was

launched to assist the Chinese Communists shortly after Kuomintang forces had captured Yenan (March, 1947) at a time when such a diversionary operation appeared necessary, or at least helpful; or else it was what Mongolian (and Soviet) propaganda claimed at the time—a border foray, which, however, succeeded in rounding off Mongolian territory (which is completely dominated by Moscow) by annexing a frontier region which was thought to contain mineral deposits, and which no Chinese government would yield except under extreme pressure. The facts available do not permit decision between these alternatives.

The opening of Communist guerrilla operations in Burma and Malaya was apparently decided upon at the regional Congress of the World Federation of Democratic Youth held in Calcutta in February, 1948; the relevant Soviet instructions were transmitted from Moscow late in 1947; and the Kremlin's own decision must therefore have been taken somewhat earlier—perhaps before the Warsaw Congress of September, 1947, at which the Cominform was launched, perhaps between that date and the end of the year. We do not know the considerations which led to this decision; but among them the purpose of hampering the Truman and Marshall Plans undoubtedly bulked large; the usefulness of aiding the Greek civil war by opening diversionary operations in South-east Asia cannot have been overlooked; and a similar diversionary aim must have been sought if, as seems probable, the Berlin blockade was already at least tentatively in preparation.

Communist disorders in Burma and Malaya—and also in Indo-China, Indonesia, and the Philippines—had many other purposes as well. The immediate achievement of Communist revolution in these countries was not necessarily among them. Politically, they would further weaken already feeble regimes in a manner certainly advantageous to Communism in the future. Economically, such disorders would be helpful to Communism by preventing the recovery of countries important both in themselves and in their relation to the economy of the West as a whole, by striking at major sources of the world's rice supply (and thus incidentally bringing pressure on India), and by keeping Britain's dollar-sterling position under strain through pressure on Malayan rubber supplies.

Strategically, aims more complex and more far-reaching were sought. Burma would open the door to Communist pressure on Assam and East Pakistan. By tying down forces otherwise available for use elsewhere, guerrilla operations in Malaya would affect Britain's world position generally and would reduce the West's defensive strength in Europe. The Philippines are strategically important in relation to Formosa, Hukbalahap operations in Central Luzon would absorb most of the energies of the Philippine Army, and the free use of Luzon by any American forces based there would be hindered or prevented.

Indo-China and Korea offer even larger prizes. As the Japanese demonstrated during World War II, Indo-China is the key position in the strategic geography of South-East Asia, and its fall would expose Siam, Malaya, and Burma to tremendous Communist pressure. Korea is no less vital as the gate to Japan across the narrow Tsushima Strait; with the whole of Korea in Communist hands as well as Vladivostok and Port Arthur, the defence of Okinawa and Formosa would become more difficult; and Japan would face envelopment both from the south and from Soviet

forces based on Sakhalin and the Kurile Islands to the north. Korea and Indo-China also affect adversely the entire military resources of the West. Both France and the whole N.A.T.O. defence structure are weakened by the constant drain to Indo-China of officers and N.C.O.'s. needed to train and provide cadres for fresh French divisions in Europe. American military, naval, and air strength is similarly diverted from Western Europe, the most vital of all the areas exposed to direct Soviet attack; and the diversion is the more serious since American defence plans provide no margin for the forces which continued operations in Korea demand.

A PROBLEM OF POWER

What can be done about Communist wars by proxy? It should be recognised at once that there is no panacea, no easy answer which we have somehow just overlooked. All Communist wars by proxy, the insurrectionary and the invasionary alike, are *political wars*. If any doubts about this existed, the results of the screening of Communist prisoners at Koje should remove them. But political wars by their very nature are long wars, wars which, beyond a certain point—and a movable point at that—cannot be shortened. The human facts can be stated in the simplest terms. Some men are so self-willed, so obstinate, so mulish by nature that only when they have butted against a brick wall until their heads are bloody and their skulls fractured or broken will they accept the fact that they must put up with it or else find another way through or around. In political wars, therefore, suffering, attrition, and exhaustion are not mere accidents; they belong to the very essence of the conflict; only through the fearful price that they impose, the brutal lessons that they teach, will refractory and rebellious men learn that the game they are playing is not worth the candle—and in some cases apply this lesson by seeking the road to reconciliation.

None of this means or implies that the West, in combating Communist wars by proxy, should simply be brutal or ruthless also, or should think that victory can be won by terror alone, or should do anything that will needlessly prolong the struggle. Nothing could be farther from the truth, or less civilised or less Christian in the true sense, or more certain to bring a fearful nemesis in its train. But what must be done, and done without flinching, is to recognise and acknowledge frankly what terrible realities we face—and then try to educate a reluctant public opinion to the same recognition and acknowledgement.

Another preliminary is also important. The Communists claim, and with much truth, that they have a simple, unique infallible technique, which must assure them victory. What Communists really seek—and the Utopian visions of the rare idealists among them cut no ice in practice—largely justifies this claim. Communists are entitled to a certain complacency about their technique because their real aim is destruction of the existing social order and its replacement by a form of tyranny no less ancient or evil in its true nature because it employs the material resources of modern technology and parades in the hypocritical robes of self-proclaimed virtue. Quite a simple technique is adequate for destruction. An axe will cut down a sapling, an oak, or an entire forest; whole armies can be, and have been, butchered with spears and swords alone. But the West can oppose

no single or simple answer to the Communist claim because the West stands for the cause of life in all its abundance, variety, and freedom—and is worth supporting only because, and in so far as, this is truly its cause. But no man can make even one acorn grow, let alone a forest. All that lies within human power is to provide conditions in which life can flourish and then wait patiently for it to do so. And what is true of individuals is true *a fortiori* of societies: Paul may plant, and Apollos may water, but it is God Who giveth the increase.

So much by way of preface. We may now attempt to apply these principles and our earlier analysis to find answers to Communist wars by proxy.

"The fundamental problem of Leninism," Stalin said in a famous passage, "is the problem of power." The same truth applies to the West. The fundamental problem of democracy, the fundamental problem of the West in the present critical struggle, is the problem of power. Since power is always relative, whatever increases our own power or diminishes the power of our enemies brings the West a step forward on the road to victory.

We can lessen the power of our enemies by killing or exhausting them; by cutting off, injuring, or otherwise reducing their food supply; by destroying their arms production or closing the routes by which weapons and munitions reach them; by sowing division and dissension in their ranks; and by killing, harrying, and discrediting their leaders. To kill and exhaust them means bringing them to battle in circumstances favourable to us; which in turn implies that the West must never stand on the *strategic* defensive, though *tactical* defence must clearly often be combined with *strategically* offensive or counter-offensive operations. To cut off or reduce their food supply means preventing them from getting food from areas nominally in our control (this is important in the Red River delta of Indo-China); forcing them from good, fertile land into poor regions where crops are bad; and driving them hard, particularly in the harvest season: air attack behind the enemy lines might be helpful for this. In East and South-East Asia no significant enemy arms production is known to exist except in Manchuria, perhaps in certain other parts of China, and in Siberia and the Soviet Far East. To attack any of these centres would risk opening a major phase of the Third World War, and is therefore precluded so long as fighting is confined to Communist wars by proxy. Closure of the routes by which weapons and munitions reach the enemy is impossible in Korea for the same reason; is difficult in Malaya (where some gun-running takes place along the Siamese frontier); and is of the first importance in Indo-China, where recovery of control over the frontier with China should be a major early objective.

The remaining items listed in the preceding paragraph—sowing division and dissension; and killing, harrying, and discrediting the enemy leaders—are either consequential upon the other efforts suggested (e.g. division and dissension will certainly result from defeat and heavy casualties, or from serious curtailment of food supplies; such casualties should also in time entail the death of leaders) or else primarily political. These and other necessary political measures lead to the most difficult part of the task—a part thick-set with obstacles and barb-wired with vicious circles and spirals.

The problem is twofold—to weaken our enemies, and to strengthen ourselves; and both parts are interconnected. As regards our enemies, the principle of solution is simple: dire penalties extending to summary execution for the obdurate few; inducements and incentives to surrender or transfer their (not very reliable) allegiance for the wavering or malleable many. This differentiation of policy is important. To attempt to win over the stubborn, dyed-in-the-wool Communists, whether their fanaticism results from conviction, from block-headedness, or from ambition, is sheer waste of time and energy. On the other hand, to attempt to terrorise the enemy masses—many of whom are in his ranks only because they have already been terrorised by him—is a policy which can never be successful in Western hands (terror did not always work even with the ferocious Mongols) and must end by giving ammunition to Communist propaganda and consolidating enemy strength.

Here again the problems that must be solved are closely interlocked. Success in guerrilla warfare (and in trapping and killing leaders) depends above all on intelligence: on securing intelligence of the enemy's plans, movements, and whereabouts, and on preventing him from obtaining similar intelligence about our own. Intelligence requires the solution of certain technical problems; in Malaya, for example, Chinese-speaking officers are needed, and the work must be done in ways adapted to Chinese customs and psychology, and not according to the formalised routine of a rigid bureaucratic system. Far more important, however, intelligence is impossible unless those supplying it are secure. But security requires that law and order shall be firmly established; which in turns leads to the social and political factors that made the growth and spread of Communism possible in the first instance.

We are thus back to the fundamental problems from which this analysis started. How are agrarian and middle-class discontent to be removed? How is Eastern nationalism to be satisfied without leading to politically fatal fragmentation? How is political strength to replace the fearful political weakness from which all the East and South-East Asian theatres of Communist wars by proxy—Korea, Indo-China, Malaya, Burma, Indonesia, the Philippines—suffer without exception? How, for instance, can the tension in Malaya be resolved which results from the Chinese desire for land on the one hand, and the Malay fear that satisfaction of this desire would have dangerous consequences for the Malays who are the peninsula's original inhabitants? Or how can Indo-China, which has known centuries of conflict between its peoples, other centuries of conquest from China and India, and which even under French rule lacked a really vigorous centralised administration, develop into a strong, unified state?

There can be no easy answer to these questions either. They also carry us back to an earlier part of this analysis which in effect pointed out that there are no answers in general terms to the problems created by life and growth. But that does not mean that there are no answers at all, or that responsibility for finding them rests in other hands than those of the Western powers—Britain, France, and the United States first and foremost.

The clue lies in two facts. The first is that Communism, because it brings opportunity to some, threatens others—and a larger number. The second is that for the West to-day, facing as it does the gravest threat to its

existence in history, the fundamental problem is the problem of creating and maintaining the power without which it will surely perish. The threat which Communism brings to the many provides a means of rallying them. The need to create the power with which to oppose the Communist menace successfully, like the parallel duty of rallying the multitudes in East and South-east Asia whom Communism endangers, must alter Western policy towards the new states of this area.

Economically, a beginning has been made with the Colombo Plan and President Truman's Point Four Programme. Though small and woefully inadequate, these are a beginning for all that. Politically, the West must abandon the idea that the grant or promise of independence to South-east Asia will enable the states of that region to stand on their own feet and the West to wash its hands of them. The old colonialism may be dead; but the responsibilities of common survival in a perilous world remain—and the dangers which West and East face alike must inspire new methods of co-operation as they already provide strong levers with which to move the dead-weight of age-old tradition and new-fangled but unattainable dreams. Militarily, the West must press for the creation of far larger local forces than have hitherto been contemplated. One of the main causes of the success which the Communists have achieved in the Asiatic wars by proxy is the wholly inadequate scale of the armed forces that have opposed them. Forces of the size required, however, will greatly overtax the relatively feeble East and South-East Asian economies (it should never be forgotten that the excessive burden imposed by the Chinese Nationalist armies on the impoverished economy of China was a main cause of the downfall of the Chiang Kai-shek regime); the arms and weapons required by these forces will therefore have to be supplied by the West; nor can the idea of a financial contribution towards pay and maintenance be rejected out of hand.

There are serious objections to all these proposals. Many are unpalatable in themselves; all suffer from lack of precision and detail. But necessity is a stern master. What matters now is not that we should have large-scale maps of the paths along which we must advance, but that we should have the faith, and above all the will, to press forward.

JULES MENKEN

CHAPTER V

ATOMIC WARFARE

SOME IDEAS ON POSSIBLE FUTURE DEVELOPMENTS

(Revised up to April 1, 1952)

THE term "atomic warfare" covers weapons about which we have little experience and the secrets of which are easily concealed. It is the subject of the most careful propaganda, part of which is the dissemination of rumours of ever more powerful bombs, the production of new and novel types of atomic weapons, and improved methods of launching and guiding them. Even the experts have only the haziest preview of what atomic warfare really means. To the average citizen it is a complete mystery.

As explained later, forecasts of the effects on warfare of such comparatively simple weapons as the machine-gun and the tank were invariably wrong. In the case of atomic warfare we are not only considering vastly more complicated weapons, but also ones which the responsible authorities in all interested countries are at pains to misrepresent. Consequently the chances of even approximately correct assessment appear remote; but that is not a good reason for shirking a subject of such immense importance to the future of mankind.

I. THE INTRODUCTION OF NEW WEAPONS—A GENERAL SURVEY

New weapons are always mishandled in the early stages of their employment, and their future influence on warfare is almost invariably miscalculated. A few examples from modern times suffice to demonstrate the truth of this statement.

When in 1884 Hiram Maxim demonstrated the first efficient machine-gun, it was hailed as a weapon which would restrict movement on the battlefield to the hours of darkness, give defence permanent preponderence over offence, keep opposing land forces organised on the European model well beyond arms length (and thus bring to an end close-quarter combat), and give armies so organised an overwhelming advantage over savage opponents in Colonial wars. None of these predictions were entirely fulfilled. The ingenuity of mankind soon developed new tactics, and new anti-machine-gun weapons. Although for a time the defence predominated over the offence, the advent of superior artillery weapons, smoke, and above all, tanks eventually restored mobility to the battlefield and swung the pendulum again in favour of the offence. Close-combat fighting—with bayonet, tommy-gun, and hand grenade—still takes place and the primitively armed tribesman remains a difficult customer to tackle.

In 1914 a few small hand grenades were thrown from an 80 mile-an-hour aeroplane, and by 1918 the pattern of the strategic bomber forces of a quarter of a century later was in being. In their early stages bomb-discharging aircraft were mostly used against tactical targets, and their strategic potentialities were not recognised. By the 1930's this view had become obsolete and the Great Powers were developing vast specialised

bomber forces. This gave birth to exaggerated opinions of their probable future influence in war. It was claimed that large industrial areas would be paralysed in a night; that, by means of direct hits and near misses, a fleet could be destroyed in a matter of minutes, and that the communications, port facilities, and process of government of an entire nation could be brought to a condition of chaos within a few weeks. Again the prophets were wrong. Navies soon developed anti-aircraft weapons powerful enough to deter attack and reduce the efficiency of the attacking bombers. Even the thousand-bomber raids on Germany in 1943-45 only reduced the industrial potential of the Reich by a small fraction; and Rommel, in both North Africa and North-West Europe, demonstrated the feasibility of operating armies efficiently against an enemy enjoying almost complete mastery in the air.

When on the Somme in 1916 a few dozen British tanks (moving at one-and-a-half miles an hour) made their first appearance on the battlefield, the new weapon was regarded as an auxiliary to the infantry, suitable for employment only against limited objectives. Nobody appreciated that twenty-five years later large, fast-moving tank formations would be employed as modern light cavalry and in a few weeks, almost unaided, bring about campaign decisions—as they did in Poland (1939) and in France (1940).

In 1915 the Germans secured complete tactical surprise when they used gas against Canadian and Indian troops. First reactions gave the impression that this means of warfare possessed almost limitless possibilities. These views were soon corrected. The use of vapour gas was found, owing to the vagaries of the wind, to be a double-edged weapon; and reasonably efficient protection, in the form of primitive gas masks, was provided within a few days. In a few months troops had been supplied with respirators which, after proper training, enable them to operate, when wearing them, with almost the same efficiency as without. Later "persistent gases" of the mustard type, discharged from shells (and consequently not dependent on the wind), were used, but by then the advantages of surprise had been forfeited. Gas played no decisive part in World War I, and this weapon, which had entered the field in 1915 with such apparently vast potentialities, was not used at all in World War II.

The above examples have been given to show the normal trend—indeed one might say the almost invariable rule—for the introduction and development of a new weapon. Bearing these in mind, it should be easier to make a correct forecast of the future of atomic weapons as applied to war. There are, however, some grounds for believing that atomic warfare is something revolutionary to which previous rules and trends may not apply, or only partially apply. We should, therefore, approach the subject with caution and not rely too rigidly on past experience to guide our judgment.

II. EXISTING EXPERIENCE

The development of atomic energy—particularly for war purposes—is cloaked in secrecy. In the United States, Canada, and our own country periodical progress reports are issued, but these give few useful details of the advances made. On February 17 it was announced that a British

atomic weapon will be tested in or near Australia in 1952, but the type of weapon had not been indicated. From Russia practically no information has been received.

Any assessment of the future of atomic weapons must, therefore, be based on the meagre information available, but mostly on reasoned surmise. This fact, coupled with the complexity of a comparatively new and revolutionary scientific discovery, makes the prophets' task a difficult one.

Existing information may be summarised as follows :

(a) There are only two instances of the use of atomic energy in war—the atomic bombs dropped on Hiroshima (August 5, 1945) and on Nagasaki (August 9, 1945). The effect of these was devastating. Tens of thousands of people were killed and incapacitated, many acres of built-up area were reduced to ruin, and a dangerous radio-active aftermath lasted for several days. In addition, the effect on Japanese morale, everywhere, must have been very considerable.

It would, however, be wrong to regard the effects of these bombs as typical of what may be expected in future. They were discharged against cities whose inhabitants were totally unprepared for their reception and surprise was complete. Moreover, Japanese buildings are, in general, not very substantially constructed and are less blast-proof than modern European buildings. It is a fact that those buildings in Hiroshima and Nagasaki of European pattern stood up to the explosions much better than those of conventional Japanese type. For propaganda purposes the most was made of the terrible effects of these two bombs. Subsequent investigations showed that the initial reports had been greatly exaggerated.

(b) Experimental bombs dropped by the United States in remote parts of the Pacific. Of these the Bikini tests in July, 1946, were the most comprehensive, have been given most publicity, and demonstrate best the effects, and uncertainties, of atomic explosions. It must, however, be emphasised that these experiments had a naval background and were designed only to assess the effect of atomic bombs on naval vessels and personnel. The tests consisted of an air-burst and an under-water explosion. Old naval and other vessels were used as target ships. The following is a summary of the results :

Air Burst (July 1, 1946)

(1) Air blast tends to crush structure above the water line and to kill and maim exposed personnel in ships.

(2) Intense heat is produced which may ignite exposed inflammable material, endanger petrol and ammunition, and cause serious burns to personnel.

(3) Radio-activity, due to gamma rays and neutrons, may affect personnel in any part of a ship at close range. This effect may be delayed.

(4) Unless very dark goggles are worn, flash may cause blindness.

(5) Damage and casualties.—A destroyer and two other target ships sank at once and one capsized. A cruiser sank the following day. Other ships badly damaged. All these were within half a mile of the explosion.

Battleships within half a mile had their superstructure damaged, but little damage was done to their hulls.

Little damage was done at distances greater than three-quarters of a mile from the explosion.

No damage occurred on Bikini Island, about three miles away.
Under-water Explosion (July 25, 1946)

(1) Estimated as being as destructive as 20,000 tons of T.N.T. A column of water 2,200 feet in diameter rose to a height of some 5,500 feet.

(2) Twenty ships were within half a mile and another forty within one mile of the explosion.

(3) Intense radio-activity was produced in the water, which at its peak would have incapacitated human beings and have resulted in death later.

(4) Quantities of radio-active water descended on the target ships, and resulted in dangerous conditions on the ships for several days.

(5) Destruction.—Two major ships were sunk; a submerged submarine was sent to the bottom. There was no serious damage to ships anchored more than half a mile from the burst.*

(c) Until some two years ago atomic energy, as applied to war, had been considered only in terms of atomic bombs discharged from bomber aircraft on the Hiroshima and Nagasaki pattern. The military and scientific experts may have thought in other terms, but not so the uninitiated general public—or non-expert Service personnel. In October, 1951, Mr. Dean, Chairman of the American Atomic Energy Commission, made two public statements on the use of atomic energy in war. In the second of these he disclosed that the United States had already developed missiles with an atomic charge which would be fired from conventional-type weapons. Since then reports have appeared in the Press indicating that satisfactory secret trials of some of these missiles have taken place—in some cases in co-operation with ground troops.

These disclosures have completely altered the conception of the future of atomic weapons.

(d) On October 6, 1951, the President of the United States announced that information had come into the possession of his Government which revealed that a second atomic explosion had taken place in Russia—the first having been reported in September, 1949.

We know, therefore, that Russia is capable of detonating an atomic explosion; but we are ignorant of the progress she has made in developing practical atomic weapons. It is, however,

* For further details of the Bikini bomb trials see *Brassey's Naval Annual*, 1947, Chapter XII. The 1946 Atomic Bomb Trials "Operation Crossroads," by "Eyewitness."

reasonable to suppose that she is still far behind the United States in this respect. In our own country much energy and money have been expended on atomic research and the decision to test a British atomic weapon in Australia in 1952 may be an indication that we are more advanced in the development of these weapons than is generally supposed.

III. THE EMPLOYMENT OF TACTICAL ATOMIC WEAPONS

It will have been apparent from earlier remarks that recent developments are likely to bring atomic energy into the realm of tactics—a trend which was not appreciated when the original bombs were used. This is a very important, perhaps revolutionary, step. The old conception, based on the 1945 bombs, visualised the atom weapon as a long-range, or so-called strategic, one. The effect was uncertain, the only known factor, a somewhat vague one, being that death and destruction would be widespread and the after-effects considerable. Consequently its use—except in areas far removed from the user's own personnel and equipment, and in territory not likely to be occupied in the near future—was prohibited. The possibilities of using atomic weapons tactically presents a very different picture, and is one which obviously merits close investigation.

Mr. Dean's disclosures indicate that the United States have already developed missiles with an atomic charge which can be discharged from existing weapons or specially designed weapons of conventional type—guns, mortars, rockets, submarines, and light surface naval craft, tactical aircraft, and even by means of small arms weapons. The possibilities of the "planted" bomb must also be considered—one placed by subversive persons, saboteurs, and parachutists.

If this possibility is fulfilled we may expect shells, bombs, rockets, anti-submarine depth charges, and other tactical missiles, and apparatus, with vastly greater destructive effect than present types, and probably with important secondary effects, such as radio-active contamination. It would obviously be premature at the present state of knowledge, and with the meagre information so far disclosed, to attempt to assess the degree of destruction likely from new weapons of this kind.

The difference between the old strategic atom bombs of the Hiroshima and Nagasaki types and tactical atomic missiles is that the former are weapons of *obliteration*, whereas the latter must be capable of control and their effect must be capable of pre-determination. It would appear, therefore, that the main difficulty in designing tactical atomic weapons will be in limiting the effect so as to be outside the range of one's own troops—rather than to produce missiles with a maximum explosion. Assuming that their production in quantities is technically possible, there are many points for consideration besides their employment in battle. Their manufacture, storage, and conveyance to the battlefield will present very real problems. If a normal shell is accidentally detonated in a factory, store, railway wagon, or lorry the effect is serious, but only local. If an atomic shell "went up" it might wreck a whole town or industrial area or, in a theatre of operations, dislocate the entire plans for a campaign or battle. It is, therefore, clear that very special safety precautions will be necessary at all stages.

In the beginning of this article it was emphasised that new weapons are almost invariably mishandled in the early days of their use. If this has been so with comparatively short-range weapons, with a very limited area of lethal effect, it will be even more so with the more powerful atomic weapons. Hitherto it has been possible to subject a new weapon to extensive trials before issuing it to troops—although, in a densely populated country such as our own, this had not always been an easy matter. With the new-type weapons—having greatly increased, and uncertain, lethal effects (and after effects)—the difficulties of carrying out trials will be much greater. In fact, it is probable that it would be impracticable to carry them out anywhere in Europe, and that all trials by troops would have to be conducted in some distant sparsely populated area. It may be that in the not very distant future—when atomic weapons have become conventional—British forces will have to travel long distance by sea or land, and by air, in order to carry out field firing practice under realistic conditions. This training aspect should not be overlooked. It is one in which the United States and Commonwealth countries, with their large undeveloped areas, have a considerable advantage over the United Kingdom and other European countries. Our potential enemy, with his vast, sparsely populated areas in Asia, has a similar advantage.

IV. THE POLITICAL ASPECT

Hitherto weapons of war have been weapons of precision. The range of an arrow was known to within a few yards. The velocity, trajectory, and range of bullet and shell can be calculated to a nicety. Predicting the speed and path of a torpedo, and the track of a descending aerial bomb, is a matter of mathematics. Similarly, their effect, being local, can be visualised and is subject to the law of averages. Possibly on an average only one bullet in one thousand finds its mark and a single bullet rarely strikes more than one man. Perhaps nineteen out of every twenty shells fired fall harmlessly to ground; but those which *do* fall on the target may kill or wound as many as thirty people, or destroy, or damage, two or three vehicles. One aircraft bomb may destroy a whole block or buildings, killing perhaps two hundred people, but the average bomb is far less harmful. Although the effect of existing weapons cannot be judged with absolute precision, we have a very good idea of what it may be in most cases. We know the "upper limit."

Atomic weapons, on the other hand, with our present knowledge and experience, are quite different. We have only the remotest idea of the likely effect of an atom bomb on London, Merseyside, or the Suez Canal. Defensive measures, although based on a veneer of scientific data, are mostly guesswork.

Conventional weapons are difficult to keep secret. The larger ones—ships, airplanes, tanks, and guns—cannot be easily concealed. With the smaller kinds it is inevitable that a few should fall into enemy hands soon after a new type comes into use. The design of many are within the grasp of one man and can be conveyed comparatively easily through agents. With atomic weapons the design and manufacture are so complex that no one individual is aware of more than a fraction of the process. This greatly increases the difficulty of conveying the secret—or, in

other words, makes it easier to keep secret the progress of atomic development.

It is believed that the very high cost of producing even one bomb—and the difficulty of isolating and processing the essential raw material—is likely to limit production for some years to come. This increases the chances of maintaining secrecy and, if the same factors hold good for tactical atomic missiles, will greatly limit the opportunities for training and practical experiment.

V. OTHER CONSIDERATIONS

Up to now atomic warfare has been considered by the general public mainly in terms of man-killing and the destruction of built-up areas—factories, docks, centres of government, etc. These are, however, two other aspects of the matter which have hardly been discussed in the Press, but which appear to be important, namely :

- (a) The effect on morale.
- (b) The effect on crops and consequently on food supplies.

(a) *Morale*

Modern weapons and methods have, if anything, enhanced the truth of Napoleon's famous dictum—"In war the moral is to the physical as three is to one"—and an atomic war would probably give it added emphasis.

Even if the atomic weapon is not used the possibility that it will be—and very suddenly, without warning—would have a marked effect on people in every walk of life, more especially those in crowded areas, such as docks and factories. Complete defence, as with normal type bombs and other conventional weapons, is out of the question; but *some* degree of protection is without doubt possible. If the morale of the civil population is to be maintained, under even the threat of the new weapon, it is vital that the outward and visible signs of whatever protective measures are possible be made apparent to all.

It is difficult to estimate the effect on morale of actual bombardment; but we can be certain that rumour and exaggeration will be rife. By the time news of an atomic bomb dropped on Birmingham had reached London and Manchester the disastrous effects would have been magnified many times.

The study of atomic defence is largely one of morale. The study of the technique of offensive atomic warfare is largely one of its effect on enemy morale.

(b) *Effect on Crops*

Without expert technical knowledge, which few possess, the possibilities of destroying crops, or sterilising the earth, on a large scale, is difficult to discuss. It would seem, however, that both are quite feasible on a considerable scale; and that with comparatively small effort, and little risk, vast areas of farmland might be made unproductive for a long period—if not indefinitely, long enough to have a major influence on the war and perhaps result in widespread starvation for many years.

VI. TO BE OR NOT TO BE?

It is almost certainly true that the main anxiety of mankind to-day is the fear of a third world war, and particularly an atomic war. It is generally accepted that in the event of another war atomic weapons will be used. It will be as well to examine this belief closely.

Considered in terms of atomic weapons a third world war could take one of the following forms:

- (a) Atomic warfare might be used by one power, or group of powers, in overwhelming strength against opponent's incapable of retaliation or only imperfectly equipped to do so. Under these conditions the war would almost certainly be decided in favour of the former in a matter of a few weeks or even days.
- (b) They might be used on approximately the same scale by both sides. The results in these circumstances are difficult to visualise. Destruction would be widespread and devastating in the initial stages, but it might "peter out" quickly owing to the sheer exhaustion of both groups of combatants or the destruction of the atomic plants and factories producing the weapons. The first effects might be so terrible as to cause both sides to shrink from further atomic action, possibly owing to public opinion or in deference to the councils of U.N.O. or some non-participants. If this occurred it might mean the termination of hostilities, or their continuance with conventional weapons.
- (c) It is not inconceivable that atomic weapons would not be used and the war be fought with conventional types. Nevertheless, the atomic weapon would still play an important, if inactive, part. The propaganda value of the threat, the necessity for both sides to prepare to use it on a large scale, and the extensive defence measures necessary would have far-reaching results—even if not a single atomic missile was dropped or fired. It would seem, therefore, that in war we cannot escape some effects of this new discovery, even if both sides fear to use it.

There is in reality no longer an atomic secret. The physical factors are well known in the laboratories of most countries. The difficulty is in manufacture and the elaborate precautions necessary against personal and material damage in the course of producing and handling radio-active materials. Although we may surmise that the United States has a substantial lead in development, this is not certain. Earlier the opinion has been expressed that secrecy in atomic matters is not difficult to maintain, and it may be that the Soviet Union is better equipped than we imagine. We therefore have the situation of these two great powers of the West and East facing each other and armed to the teeth, but neither knowing precisely what the other has in store for them from the major weapon. Until last February no indication had been given as to British progress in the development of atomic weapons. We now know that a British weapon, or weapons, of this type is to be tested this year. If these tests prove successful, and we are in sight of quantitative production of British atomic weapons, it would be reasonable to assume that the Western

group of Powers has a considerable advantage over their potential opponents in developments for this type of warfare. There is, however, no certainty as to the relative progress in different countries: we rely on surmise and assumption.

This unknown quantity would appear to be a factor for peace. In Korea we have witnessed a war in progress for more than two years—nominally between United Nations forces and North Koreans with Chinese Communist volunteers. In this campaign atomic weapons have not been used nor, one imagines, seriously contemplated, and this supports the theory that war does not necessarily mean atomic war. This example is, however, obviously one which must be treated with caution, as no Great Power has been seriously extended. It is “limited war” for the United States and the other United Nations participants, and war by proxy for the Soviet Union. In an all-out struggle to the death the temptation to use atomic weapons would be much greater.

The behaviour of human beings in given circumstances has never been easy to predict, and different nationalities and races act differently under similar conditions. We cannot, therefore, say with certainty whether the atomic weapon is a factor for peace or not; or whether, in the event of another world war, atomic weapons will be used or not.

The writer's opinion, and it is one with which many will disagree, is:

- (a) That the existence of atomic weapons in the possession of both groups of Powers makes it likely that war will follow the “cold” pattern and that when it becomes “hot” it will be on a small scale—as in Korea, Malaya, and Indo-China. Fear of an atomic war, with devastating consequences, is likely to prevent another conflict on the 1914–18 and 1939–45 patterns.
- (b) That *in the event* of another major war atomic weapons will probably be used, although this is not certain. If not used, the threat of using them will, however, have a major influence on the course of events.

VII. THE PATTERN OF AN ATOMIC WAR

Although the opinion has been expressed that a third world war will not necessarily be an atomic war, the probability remains that both belligerent groups will possess atomic weapons in some form—perhaps in a variety of forms. Nations fighting for their lives are not in the habit of foregoing the use of any weapon or device which they believe may assist them to win. Consequently we must be prepared to fight with, and defend ourselves against, atomic weapons. It would indeed be disastrous if any impression that atomic weapons will not be used resulted, even to a small degree, in neglect of our offensive and defensive measures in this respect.

It will, therefore, not be out of place to conclude this chapter by attempting to describe the pattern of an atomic war—although it will be apparent that such an attempt is based largely on conjecture and is little more than a fantasy of the imagination.

(a) *Preliminary moves*

It can be assumed that any war in which atomic energy is employed will be between the full array of the East and West groups of powers, and will

be world-wide in character. It is not likely to be used in a "side show."

Either before or immediately after (if aggression is sudden) the opening of hostilities there will be much activity at U.N.O. Headquarters. In this the smaller nations would probably play the chief part: the Great Powers will be too occupied with preparations for or the actual conduct of operations. As the aggressor will have laid his plans in the minutest detail it is reasonable to suppose that he will have foreseen with some accuracy the reactions of U.N.O., and his course of action is not likely to be changed thereby. Once hostilities are imminent, or have started, U.N.O. will be powerless to halt the march of events.

(b) The opening blows

As a long atomic war would be almost equally disastrous for victor and vanquished alike, it is certain that the aggressor will aim at a knock-out series of blows within the first few days or at the most weeks. He is not likely to have a large stock of atomic bombs and the few he *does* possess will be directed at targets of such importance that their successful detonation will leave the enemy powerless to continue the war and force him to sue for peace. Such targets would be the enemy atomic plants, his seat of Government, vital industrial areas, in the case of a naval power the enemy fleet, docks, warehouses, and supplies of food and essential raw materials.

There are several ways in which such an assault might be wholly or partly frustrated—some secret and revolutionary defensive measure, immediate reprisals resulting in a crippling blow to the aggressor's atomic plants, etc. If the initial strategic atom bombing (on Hiroshima lines) was evenly matched it might result in both sides exhausting their supplies of big bombs after mutually causing heavy damage and loss; but not, in either case, inflicting a mortal blow. If it were otherwise, and one side gained a considerable mutual advantage, it is difficult to see how the weaker side could continue the struggle.

(c) The Second Phase

If a speedy decision was not reached we should be faced with a situation in which what may be called the "secondary," or tactical, atomic weapons were brought into action.

At sea warships and merchant vessels would be attacked by atomic torpedoes and atomic missiles from tactical aircraft. Atomic depth charges would be used to attack submarines. Atom ships, with rockets and guns firing atomic missiles, would bombard harbours, ports, and enemy shipping.

On land the opposing armies, if equally matched, would inflict huge casualties on each other with guns, mortars and rockets, and with tactical aircraft firing missiles with an atomic charge.

In the air bombs of the Hiroshima type would be used occasionally as supplies became available, being limited by the fact that initial stocks would have become exhausted and new production hampered by the probable damage to the sources of production during the first onslaught. The effectiveness of this kind of atomic warfare might also be reduced, as defensive measures would probably improve as the war progressed.

Tactical air action with atomic weapons (small bombs or rocket missiles) would continue, causing heavy casualties without producing decisive results.

(d) The Final Phase

If the foregoing paragraphs approach a true estimate of the course of events it will be apparent that an atomic war will be a very exhausting business for both sides. Casualties and damage to buildings, etc., will be immense, and the effect on the nerves, and morale, of the survivors will be shattering. It seems possible, therefore, that at a comparatively early stage both groups of belligerents may be prepared to discuss armistice terms, and this may give an opportunity for U.N.O., or what remains of it, to sponsor negotiations. Alternatively, the war might go on with conventional weapons, the use of the atomic type being restricted to the few which the combatant nations' remaining resources could produce.

The above survey of the possible course of an atomic war pre-supposes that the two groups of belligerent Powers are almost equally matched. History does not record many examples of this with conventional-type weapons, and it appears very unlikely that such a condition would exist with atomic weapons. It is much more probable that if the atomic weapon is used it will be found that one side preponderates in types, technique of employment, and possibly defensive measures. In this event the likelihood of hostilities lasting more than a few weeks is remote.

VIII. CONCLUSION

The arguments put forward in this article—and it is emphasised that they are mostly based on assumption—may be summarised as follows :

- (a) The existence of atomic weapons reduces the chances of a third world war.
- (b) Should a third world war come about it will not necessarily be an atomic war. The probable effects of atomic warfare, combined with fear of heavy reprisals, might result in both sides confining the fighting to conventional type weapons.
- (c) If atomic weapons are used it is very likely that one side will be found to possess a marked advantage which will prove decisive within a few weeks. Thus the war will end quickly, with an overwhelming victory for one side or other.
- (d) In the event of both sides using atomic weapons and being approximately evenly matched, the casualty rate and destruction in the early stages will be immense. Both groups will quickly degenerate into a condition of shambles, and the war is likely to end, through sheer exhaustion, by negotiation.

It is difficult to write an article of this kind without giving the impression that an atomic war will be an experience transcending in horror and destruction every previous experience of mankind. This may indeed be the case, but this view must not be over-emphasised or accepted as certain. As pointed out early in the chapter, similar prophecies have been made about other weapons—gunpowder, machine-guns, submarines, tanks, and bomber aircraft—but the ingenuity of man overcame the worst effects of them all.

We do not know. Let us hope that the Governments and peoples of the world will have the sense not to attempt to find out by practical means.

Since 1945 the morality of atomic warfare has been dealt with exhaustively, and no attempt has been made to discuss this aspect of the subject here. The article has been written dispassionately—on the assumption that a nation will take every profitable means to win if it becomes involved in a major war.

C. N. BARCLAY

CHAPTER VI

THE PROGRESS OF AMERICAN REARMAMENT

THE OVERALL PLAN

THE EIGHTEEN months between the beginning of 1951 and the middle of 1952 have witnessed the most critical phase in the reconstruction of America's military strength from the alarmingly low point to which it had fallen before the outbreak of the Korean war. In general the worst problems have been overcome in every field, with the possible exception of aircraft production, and from mid-1952 onwards the American rearmament programme will proceed along orderly lines, with the reasonable prospect that it will be capable of meeting any demands that may be made upon it. This does not mean, of course, that everything has gone or will go according to plan; there have been many delays and alterations in the original plans which were drawn up in the months after the beginning of the Korean war. In several fields the original conception of a concentrated effort over a three-year period has had to be extended to four or four and a half years, and instead of a peak of military production in 1953, it is now expected that a moderately high level will be reached towards the end of 1952 and will continue until the end of 1954. It does mean, however, that the worst shortages of man-power, raw materials, machine tools, and manufacturing capacity have been overcome, so that the output of actual military equipment can be expected to rise steeply from the middle of 1952 onwards.

In the financial years 1950-51 and 1951-52 Congress appropriated \$108 thousand million for defence. At the time of going to press it was being asked to appropriate a further \$52 thousand million, a request which was meeting with some resistance in Congress. Of the \$108 thousand million already appropriated some \$70 thousand million had been allocated by January 1, 1952. The balance of \$38 thousand million together with the appropriation for 1952-53 will it is estimated be spent by the end of 1953. The proportion spent on actual production, as distinct from maintenance and operational cost, is now running at about 50 per cent. and is expected to rise to about two-thirds. Delivery of what are known as "hard goods," finished equipment, aircraft, and vessels are currently running at the rate of about \$2 thousand million a month (including equipment for America's allies) and is expected to reach over \$5 thousand million a month by the middle of 1953.

The amount of money devoted to the military budget does not give a complete picture of America's growing military strength, since it does not take account of the expansion of industrial capacity which is an integral part of the rearmament programme. Under a system of tax reliefs and other concessions, American industry is expanding at a rapid rate, especially in the industries, such as steel-making, which form the basis of a capacity to wage war. Steel-making capacity is now 109 million ingot tons a year, as against about 84 million tons in 1950, and is expected to reach 120 million tons by the end of 1953. Aluminium production will be over a

million tons in 1952 as against 836,000 in 1951. During 1952 the capacity of the American chemical industry will reach two and a half times that of 1939. The expansion of transport and mining is on a similar scale, and by the end of 1952 most of the crucial shortages of materials will have disappeared.

The build-up of the armed forces is best illustrated by comparing June, 1952, not against 1951 but against June, 1950, the outbreak of the Korean war. At that time the total military force was 1,460,000 men. It is now three-and-a-half million. The Army has expanded from 590,000 men to 1,570,000, from 10 divisions and 11 regimental combat teams (the equivalent of a brigade) to 20 divisions, 18 regimental combat teams and 100 A.A. battalions. The Navy has expanded from 380,000 to 790,000 men and has more than doubled the number of ships in commissions to over 400. Like the Army, the Marines have tripled their strength, from 74,000 to 219,000 men. The Air Force, has expanded from a little over 400,000 to a little under a million men and from some 48 groups to about 90.

THE ARMY

In the United States the Army is the senior Service, and that this is so in fact as well as in name is shown by the way in which most of the important military diplomatic posts have since the war been held by soldiers. It is therefore not surprising that, when the time came for General Eisenhower to seek release from his post as Supreme Commander Allied Powers Europe in May, 1952, he should be succeeded by another soldier, General Matthew Ridgway, at that time the Supreme Commander in the Far East and the United Nations Commander in Korea. Prior to the Atlantic Council's request for the President to appoint an American officer to succeed General Eisenhower, it had been felt both in Washington and in Europe that Lieutenant-General Alfred Gruenther, who had been General Eisenhower's Chief of Staff at S.H.A.P.E., would be equally well qualified; but General Ridgway's appointment gave great satisfaction, and the fear which was felt by some of the European countries at the prospect of losing General Gruenther's knowledge of and sympathy with European rearmament problems was allayed by his consenting to remain as General Ridgway's Chief of Staff. General Ridgway was succeeded as Supreme Commander in the Far East, a task made at once easier and more difficult by Japan's return to the status of a sovereign nation on May 1, 1952, by General Mark Wayne Clark, who had been very much in the public eye as Commander of the Fifth United States Army in Italy during the late war, had spent the last three years in the unglamorous but vital post of Chief of the Army Field Forces, where his particular skill as an organiser of training had done a great deal to improve the quality of the peacetime Army.

The United States does not have National Service in quite the sense that that term is understood in Britain. There have been several attempts to induce Congress to enact a scheme for universal military training which would have the effect of giving six months' military training to every able-bodied 18-year-old male. But at the time of going to press the plans had been without success in 1952. The manpower of the American Army is derived from three sources: the regular army, which is about half a million strong; the National Guard, of 27 divisions, which, except that it exists on

a basis of state law, is roughly equivalent to the British Territorial Army, of a present strength of 225,000, which it is planned to raise to 362,000 during the coming year; and the Army Reserve, which exists largely on a unit basis and whose strength it is planned to raise from 160,000 to 270,000 in the coming year. From July, 1950, to December 31, 1951, 117,000 National Guardsmen and 216,000 Reservists (the former mostly in divisional formations, the latter mostly as individuals) were called on active duty. The balance in the threefold build-up of the Army in the past eighteen months has been found from the "draft," a system of compulsory call-up geared to the monthly needs of the Services (in practice entirely for the Army and the Marines) for youths between 18 and 26, with a wide margin of exemptions. The monthly intake has averaged about 30,000 men.

The peculiar problem that the Army faces is the loss in the fiscal year 1952-53 of over one-half of its strength or about 750,000 men. The reason is that during the months of hasty re-mobilisation following on the reverses in Korea a very large number of reservists and draftees were taken in on a two-year engagement, which is now beginning to expire. This means that a heavier call will have to be made on the "draft" and that the initial training resources of the Army will be strained to their utmost. There are encouraging signs that many of those who have done their two years' service are re-enlisting, and that the supply of junior officers, hitherto a most critical shortage, is improving. Nevertheless, the problem of turnover will be particularly severe in the coming year.

However, there is one aspect of this swift rotation of manpower which has proved a godsend to the re-training of the American Army. A total of 200,000 men and officers have had battle experience in Korea and been returned to the United States. Only 300 men spent both the first and the second winter in Korea. It is an expensive policy and at times it has presented great difficulties for unit commanders in Korea, but in terms of seasoning an army that is largely composed of Reservists and young draftees Korea has been invaluable.

The Korean campaign has also provided invaluable lessons in other directions. It has enabled new battle techniques to be worked out, including supply by helicopter and a revolutionary system of field surgery. Most important of all, the early reverses have lead to a reconsideration of current tactical doctrines, particularly the importance of defence in depth and the siting of all-round defensive positions to counter infiltration, an aspect of battle in which the American Army had hitherto, in view of its insistence that the offensive was the only legitimate operation of the war, been very weak. The training facilities within the United States have been very greatly expanded and now have a total capacity of 194,000 men. The two major exercises of the year were "Snowfall," a cold weather exercise held in New York State in February, 1952, and "Longhorn" in Texas in April, 1952, which involved a large-scale airborne drop. Both were designed to develop and test the tactics which would be used in connection with tactical use of atomic weapons.

There has been considerable controversy during the last twelve months about the quality and quantity of the new weapons which the Army is receiving. There is no doubt that there is a severe shortage of both operational and training equipment for units in the United States, and

there has been the inevitable rash of Press stories that the American soldier in Korea was not getting the weapons he deserved, and that the production of guns was being sacrificed to civilian butter. Such criticisms overlook two very important points. The first is that the United States is not only supplying its own armies but those of half the free world as well. Its very considerable stocks of war-time equipment and ammunition have gone either to Korea or abroad. Although its programme of military aid to other countries is seriously behind schedule, the United States had by the end of March, 1952, shipped to its allies 9,000 tanks, 34,000 vehicles, 790,000 small arms, and nearly 300 million rounds of ammunition. It should be remembered that the French forces in Indo-China have operational priority for supplies second only to Korea.

The second point is that the Korean war found the Army, owing to the starvation of funds for research and development in the preceding four years, with few new equipments ready for production. Thus the M.46, a hastily revised version of the wartime M.25 tank, was put into production for use in Korea. Owing to defects the new post-war tanks, the M.41 light and the M.47 medium tank, were not ready for full production before the spring of 1952, despite the fact that they were produced virtually direct from the drawing-board. The unwillingness to finalise on a particular design has been characteristic of a period when the Administration and the Chiefs of Staff have been emphatic that they are not rearming to engage in total war but in order to prevent one, and that design is at this stage as important as production.

THE NAVY

On July 22, 1951, Admiral Forrest Sherman, the Chief of Naval Operations, collapsed and died during a visit to Italy, thus robbing the Western Allies of one of their ablest and wisest senior officers. He was succeeded by Admiral William Fechteler, who at that time was Commander-in-Chief of the Atlantic Fleet. The command of the Atlantic Fleet went to Admiral Lynde McCormick, who had hitherto been Vice-Chief of Naval Operations and who had earned a considerable reputation as a planner of naval strategy under Admiral Nimitz in the Pacific. It had been agreed early in 1951 that the Commander-in-Chief Atlantic Fleet should also be the Supreme Commander of the North Atlantic area under the North Atlantic Treaty Organisation, but as a result of disagreements between the British Government and the other N.A.T.O. countries, Admiral McCormick was not officially appointed to the latter command until January, 1952.

Unlike the other two Services, the United States Navy is not suffering from a shortage of equipment and trained men to meet the needs of to-day and to-morrow, and its expenditure is to a much greater extent than the Army or the Air Force directed towards research and the development of fundamentally new weapons and tactics. In the middle of 1952 there were about 1,800 ships of all types in the Active Fleet and about 1,500 in the Reserve or "Mothball" Fleet. This represents a threefold increase in the total strength of the Active Fleet since the outbreak of the Korean war.

On July 1, 1952, there were four battleships in commission, the Missouri, Wisconsin, New Jersey, and Iowa. There is one other modern battleship of the 'Iowa' class, the Kentucky, in reserve, and another of a different

class, the Hawaii, partially built. There were three of the large 'Midway' class carriers in commission, nine of the medium-sized 'Essex' class, nine light carriers, and ten escort carriers. The rest of the first-line ships in the Active Fleet are made up of 100 combat (as opposed to training) submarines, 15 heavy cruisers, 3 light cruisers, 1 A.A. cruiser, 244 destroyers, 38 troop transports, 34 attack cargo ships, and 7 command ships (for combined operations), making a total of 477 major ships.

The United States Navy is at present deployed in four main formations: the Seventh Fleet under Admiral Radford based on Hawaii, and specifically charged with the neutralisation of the Chinese nationalist forces on Formosa; the force supporting operations in Korea; the Atlantic Fleet based on Norfolk, Virginia, which is now actively engaged in working out new methods of submarine detection and destruction with Britain and the other N.A.T.O. powers; and the Sixth Fleet in the Mediterranean. The Sixth Fleet is under the command of Vice-Admiral J. H. Cassady and under the general command of Admiral Jerauld Wright, as the Commander of the United States Naval Forces, Eastern Atlantic and Mediterranean. The Sixth Fleet, which consists of two fast carriers, a division of cruisers, and some twenty destroyers, is entirely waterborne, and is rotated and supplied direct from the United States. It was in her performance of this rotation that the carrier Wasp struck and sunk the destroyer Hobson on April 26, 1952, on their way to join the Sixth Fleet.

Probably the most important commissioning of the year was that of the submarine Trigger, in March, 1952, the first submarine of entirely post-war design to be completed with new radar and sonic devices. Although at present powered by diesel engines, it seems that she is capable of conversion to hydrogen peroxide propulsion. Work is progressing on the new 57,000-ton flush-deck carrier Forrestal, and the keel was due to be laid in the summer of 1952.

In June, 1952, the size of naval aviation consisted of 10,000 operational aircraft, including 14 carrier groups and 34 patrol squadrons. The Chairman of the Joint Chiefs of staff announced in May, 1952, that the goal for mid-1953 was 16 carrier groups, 15 anti-submarine squadrons, and 34 patrol squadrons. The growing importance of naval aviation in support of land operations can be deduced from the fact that 47 per cent. of the sorties in Korea during 1951 were flown by carrier-based aircraft. Moreover, because of greater simplicity and uniformity of design in naval aircraft, the Navy seems during this period to have been more successful than the Air Force in getting delivery up to schedule of new types of aircraft.

The United States Marines who, despite strong congressional pressure to make them into a fourth Service with a seat on the Joint Chiefs of Staff, are still administered by the Navy Department, are in process of expansion to three divisions and three air wings consisting of 27 fighter and close-support squadrons. It is generally acknowledged that the Marine air wing in Korea has proved more effective at giving close support to ground troops than anything provided by the Air Force, where the doctrine of close support had almost died out and has had painfully to be re-learned.

In general it is acknowledged, though only as the result of sharp battles within the Pentagon, that the role and importance of the Navy is changing. The development of the guided missile with either an explosive or an atomic

war head, the progress towards an atomic bomb which can be delivered by a carrier-based aircraft with a 770-mile radius, the likelihood that future operations may be carried out in parts of the world where land bases for aircraft will be difficult to establish, clearly give the United States Navy an importance in offensive operations which had previously been underrated. Although its role in keeping open the sea lanes and in giving mobility and protection to land forces will presumably remain as important as ever, its function as the deliverer of fire power against the enemy on land is likely to increase.

THE AIR FORCE

There is no doubt that it is the United States Air Force which faces the gravest problems, since its area of responsibility confronts the one in which the Russians have made the greatest strides. During the fiscal year 1951-52 Congress authorised the expansion of the Air Force from a figure of 70 groups to a total of 95. The target for the year 1952-53 is 126 combat groups and 17 troop-carrier and support groups. At the same time permission has been sought to increase the size of the Air Force from 1,061,000 officers and men to 1,210,000. It is clear that only a start can be made towards the building of the 143-group Air Force during 1952-53. It was originally intended that the build and equipment of the force would be complete by the middle of 1954, but this was based on what are now admitted to be unrealistic assessments of plane production, and the Secretary of the Air Force, Mr. Thomas Finletter, said in January, 1952, before a congressional committee that he does not expect it to be complete before the end of the calendar year 1955. Aircraft production, which was due to reach a rate of 1,250 a month in 1953, will now be at a rate of 900 a month.

The United States Air Force has three defined tasks. (1) Strategic operations, aimed at destroying the vital war-making capacity of an enemy. For this task the United States bears almost the whole responsibility among its allies, since the United States Strategic Air Command is the only allied air force with long-range inter-continental bombers. (2) The Air Defence of the continental United States and of critical areas in Europe and the Far East, particularly against atomic attack; this is the primary role of the Air Defence Command. (3) The tactical support of ground troops both in Europe and the Far East. The Tactical Air Command was only created in September, 1951, after the development of the N.A.T.O. defence plan and the lessons of the Korean war had made clear the extent to which fighter and bomber support to ground troops was essential.

The performance of the Russian MIG.15 in Korea and various press reports have given rise to a great deal of public controversy during the last year as to present and future strength of the Air Force and about the kind of planes which it is getting. It is not easy for a layman to enter into this argument, except to note that the United States Chiefs of Staff continue to defend their aircraft production and procurement policy against the attacks made on it, as being along the right lines. In particular, they have stressed the importance of attaining the highest quality in design and workmanship, even at the expense of rapid production, if the technological advantages of American industry are to be exploited to their full. The fact remains, however, that in mid-1951 the United States Air Force had only 9,200

combat aircraft, and although production for the Air Force was running in mid-1952 at an estimated rate of about 450 a month, production must compete with a high rate of obsolescence and with battle losses in Korea. It has been estimated in the technical press that in terms of the latest jet fighters and bombers about 80 per cent. of the planes in the Air Force are obsolete or obsolescent.

There is little to add to the survey of aircraft types contained in "Brassey's Annual" for 1951. In May, 1952, the Air Force released photographs of the Boeing B-52 bomber, which is driven by eight J-57 Turbojets which are estimated to give a speed of 550 miles per hour. Although the first model is now conducting flying tests, it is not expected to be in production before 1954. It also released details of the Convair YB-60, which is a swept-wing version of the B-36 (the standard inter-continental bomber of the Strategic Air Command), which will have a range of 10,000 miles at 600 miles per hour. The range of the B-47 the standard medium day bomber, has been increased to 4,000 miles. The B-57, an American modification of the English Electric Canberra, which will be the standard medium night bomber, will not be in the hands of units for another year or so.

In May, 1952, the Air Force announced that it was converting its navigational calculations from miles per hour to knots.

ATOMIC WEAPONS

In 1949 and 1950 the United States did not explode any atom bombs. In 1951 it exploded fifteen bombs and by mid-1952 had detonated another five at the Atomic Energy Commission's testing ground in Nevada. Although the security with which the whole development of atomic energy is hedged has been only very slightly relaxed, it is clear that the number and versatility of atomic bombs is increasing rapidly, and it has been speculated that the American stock-pile will have reached four figures in the near future. The size of the bombs which have been detonated has varied all the way from the block-buster dropped at Eniwetok in May, 1951, with an explosive force of 120,000 tons of TNT to the very small atom bomb dropped in Nevada in October of the same year with a force equal only to one ton of TNT. It is also clear that the development of airborne atomic bombs is towards packing the fissionable material into a lighter casing and compressing it into a smaller size so that it does not need a heavy bomber to transport it. In American military doctrine the atom bomb is now considered in two aspects : (a) the heavier type as a weapon of the Strategic Air Command for use against enemy cities and industrial areas ; (b) the lighter tactical bomb as a weapon of the Tactical Air Command for use in support of ground troops either to destroy enemy formations or to deny vital defence points such as bridges or river crossings to the enemy. In several of the lastest tests troops have been sited in dug-in positions and their closeness to ground zero has been reduced to about three and a half miles without causing any casualties.

All three Services are conducting experiments with atomic missiles and atomic energy. The Army has developed a very heavy mobile artillery piece, reported as weighing 75 tons, which can fire an atomic shell with considerable accuracy. The Navy is experimenting with atomic depth

charges and mines and with missiles which can be launched against enemy coastal installations. It also has under construction a submarine, the Nautilus, which will be powered by an atomic reactor, whose keel was laid in mid-1952 and which may be ready in 1953. The Air Force has two companies under contract working respectively on the airframe and the engine for a nuclear-powered aircraft; but this is not expected to be ready for some time.

ALASTAIR BUCHAN

CHAPTER VII

POLITICAL WARFARE

POLITICAL warfare, or psychological warfare as the Americans prefer to call it, has existed since the dawn of military history. Its tasks have always been the same: (1) to undermine the morale of the enemy and to convince him of the inevitability of ultimate defeat, and (2) to sustain and foster the resistance of potential allies in enemy-occupied territory and to ensure that their actions are co-ordinated with the general strategy and not wasted prematurely. A typical example of political warfare in classical history was the order given by Themistocles to the Athenian fleet to write notices on stones on the shores of the Ionian islands instructing the inhabitants to hamper the Persians with all the possible and reasonable means at their disposal.

To-day modern science has improved the weapons of political warfare. Leaflets and surrender passes are distributed by air; and a leaflet bomb, invented by the Americans, can now drop a concentrated shower of leaflets over a given target. During the last war a daily German newspaper, written and printed in England, was dropped solely by air over the German troops in the West. Radio, however, was the chief propaganda weapon of the last war and remains to-day the chief weapon of the cold war. Nevertheless, it was not until the last war that political warfare was officially recognised as the necessary handmaid of policy and strategy and that the name itself became part of our official language.

ORGANISATION DIFFICULTIES OF THE LAST WAR

Like most British innovations, the organisation of political warfare during the last war was a gradual process of improvisation, and the final structure, even then far from perfect, was not achieved until late in the war after a series of costly errors and experiments. At the beginning of the war the British Government had adopted for our propaganda services the model of the 1914-18 war; that is to say, there was a Ministry of Information which dealt with all matters of publicity concerning not only Great Britain and the Empire but also all neutral and Allied countries. At the same time a separate and secret department, responsible to the Foreign Office, was established for propaganda to enemy and enemy-occupied countries. It was given somewhat nebulous and unsatisfactory powers of issuing directives to the European Service of the B.B.C.

Unfortunately, this secret department was situated in the country over forty miles from London. This geographical separation was a severe handicap. The department, rich in talent, was too far away from Whitehall to win the confidence of the political and Service departments on which it depended for essential information. An even more serious obstacle was the physical separation from the B.B.C. European Services, which, unfortunately for the subsequent conduct of political warfare, were concentrated in Bush House and not in Broadcasting House. Practical experience soon showed that control of broadcasting cannot be

exercised efficiently unless the controlling body itself is close to the microphone. The initial confusion became aggravated when the German armies overran most of Western Europe. The newly occupied countries came automatically under the control of the department for enemy propaganda, which, perhaps not unreasonably, preferred to use its own trained staff for those new tasks. Inevitably this procedure did not improve relations with the Ministry of Information, which had previously controlled propaganda to these countries, and lobbying in Whitehall for a single authority for all forms of propaganda became acute.

With various patchwork modifications this unsatisfactory state of affairs continued until June, 1941, when Mr. Duff Cooper, now Sir Alfred Duff Cooper, and then Minister of Information, made a bid in the Cabinet for the single control of all propaganda. He was defeated because the Service Departments refused to give advance strategic information to a department engaged mainly in publicity. Mr. Duff Cooper's request, however, forced the Cabinet to deal with an intolerable situation, and in July, 1941, the first Political Warfare Executive was established. Control was vested in a committee of three Ministers with Mr. Eden as chairman. A second committee of three officials was appointed to supervise political warfare and to report weekly to the ministerial committee. Much against his will, the writer was appointed chairman of the committee of officials.

From the start the new scheme did not work, and in February, 1942, the Political Warfare Executive was given a new charter under the control of two Ministers, Mr. Eden for policy and Mr. Bracken, now Viscount Bracken, for administration. The writer was appointed Director-General. A new agreement was made with the B.B.C. Governors, who readily transferred to the Political Warfare Executive policy control of broadcasts to enemy and enemy-occupied countries. The Political Warfare Executive then moved into Bush House, and gradually all the members of the original department for enemy propaganda, except those engaged in the most secret activities of political warfare, were brought back to London. In May, 1945, single ministerial control was vested in one Minister, the Foreign Secretary. Although it came too late to affect the fortunes of the Political Warfare Executive, this single ministerial control was a great improvement.

STRUCTURE AND ACTIVITIES

The Political Warfare Executive was organised on a central and regional basis with regional directors for Germany and for the enemy-occupied countries. The general lines of policy were laid down by the central authority after consultation with the competent departments of the Foreign Office and with the Chiefs of Staff Organisation. Within this framework considerable latitude was allowed to the regional directors, who worked closely with the corresponding sections of the European Services of the B.B.C. As regards broadcasting, the existence of Political Warfare regions and B.B.C. sections was an unsatisfactory form of duplication which, in the writer's opinion, should not be repeated in any future organisation.

From the first days of its existence the Political Warfare Executive received great help and much good advice from the Chiefs of Staff

Organisation. Indeed, during the period of trial and error, when many mistakes were made, it is probably true to say that it owed its survival to the support of the Chiefs of Staff. This assistance was the more valuable because the Political Warfare Executive was composed almost entirely of temporary personnel and had to learn its own job during the war. As every exponent of political warfare has or should have the qualities of a prima donna, he must be given as free a hand as possible. At the same time, he must conform with the requirements of official policy and strategy. As he has to act at great speed, there is always ample room for mistakes. It was fortunate for the Political Warfare Executive that it was able to improve its technique during a period of the war when propaganda was not only ineffective but could have little effect. Political warfare is no substitute for lack of military success. At the best it can minimise the extent of failure and keep alive the spark of hope in enemy-occupied countries. In war its real opportunities come with the first signs of successful resistance.

In the various activities the Political Warfare Executive was divided into overt and covert compartments. In its overt or "white" aspect it spoke and acted as an official organ of the British Government. Its covert or "black" activities were secret. There were white leaflets, white miniature magazines, books and newspapers, and white broadcasting. There were also black broadcasting stations allegedly operated by disaffected enemy subjects inside enemy territory, black literature, and other black activities about which little can be said.

In its white activities the Political Warfare Executive soon learnt that the credit which a propagandist enjoys both in enemy and in enemy-occupied countries is in direct proportion to the accuracy of his information. In this respect the broadcasts from Bush House achieved a high reputation for reliability. In the early days of the war, however, difficulties arose from inaccurate official communiqués. The Political Warfare Executive had, of course, no say in the drafting of official communiqués, but their accuracy is of supreme importance to the work of every white propagandist. In war, radio is the quickest means of information, and each side listens in to every broadcast from the other no matter in what language it is delivered. Each, too, is eager to exploit the errors of the other, and a serious mistake can undo months of successful work. This applies with particular force to the bombing of cities where both the enemy and the enemy-occupied populations can see the results for themselves and are inclined, if extravagant claims are made, to assume that the official communiqués of all belligerents are "doctored."

Fortunately, with improved technique, British communiqués became more reliable, whereas the German official bulletins tended increasingly to exaggerate. Perhaps the biggest propaganda blunder of the war was on October 8, 1941, when the *Volkskischer Beobachter*, the official Nazi newspaper, announced in huge headlines: "The Great Hour has struck. The Russian Armies are Encircled. The War in the East is Ended." It was a gift which we received gratefully.

The black propagandists, of course, enjoyed an almost free hand. Their operations were various and highly ingenious, extended both to enemy and to enemy-occupied countries and embraced broadcasting, the dissemination of literature by secret methods, and the transmission of

secret instructions to resistance groups in occupied countries. In all its work the Political Warfare Executive co-operated very closely with the Allied Governments in exile in London, and in view of the numerous languages in which political warfare was conducted had to rely to a large extent on foreigners.

With the entry of the United States into the war the work of the Political Warfare Executive was greatly extended, and co-operation with the Americans became a first necessity. American psychological warriors came to London, and the Political Warfare Executive established its own mission in Washington for political warfare against Japan.

In London this Anglo-American co-operation suffered from growing pains, for the Americans made much the same initial mistakes as we had made, and the appearance of two rival American propaganda organisations was an additional handicap. When these difficulties were eliminated, collaboration again became complicated when Anglo-American military operations began, and General Eisenhower set up his own branch of psychological warfare. Fortunately, he put all the Anglo-American organisations under one head and made an arrangement whereby the military psychological warfare branch should conduct all operations in the field and accept political guidance from the civil branches in London. Here again geographical separation might have created rivalry and misunderstanding, but General McClure, the American officer in charge of the military political warfare, was both fair-minded and tactful. The Political Warfare Executive sent some of its best experts into the field, and political liaison was maintained by a tripartite committee composed of the Anglo-American civil agencies and representatives of General Eisenhower's branch. This committee sat in London under the chairmanship of the Director-General of the Political Warfare Executive.

From 1942 until the end of the war the Political Warfare Executive's work became more and more closely linked with the military operations, and reached its culmination in the preparations for D-day. Planning began in October, 1943, and the first major activity was the initiation of "The voice of S.H.A.E.F." on the European Services of the B.B.C. The broadcasts, which had to be approved by S.H.A.E.F., were sent out in French, Flemish, Dutch, Danish, and Norwegian to enable General Eisenhower to give his direct instructions to the civil population on the coast of Western Europe and to keep the enemy guessing about his intentions.

For some weeks before the invasion a staff of the Political Warfare Executive linguists was engaged in the task of translating all the official proclamations which were to be released on D-day. Four days before the invasion two printing presses, under military guard, produced the D-day leaflets. The total came to 32,000,000, the bulk being in French and German. All this work had to be done in the greatest secrecy, and at high speed. To quote only one example of the rapidity with which the Political Warfare Executive had nearly always to act, a demand from Divisional commanders at the front for leaflets describing the advantages of surrender was received two days after D-day. We had anticipated the request and were able to supply the Anglo-American Air Forces at once. Within twenty-four hours of receiving the request 1,500,000 leaflets were dropped by air on front-line targets in Normandy.

The Political Warfare Executive also performed a minor but useful part in assisting the organisations engaged in deception and subversion, and in the last year of the war its Director-General was appointed chairman of a Chiefs of Staff sub-committee to co-ordinate these activities in so far as they concerned one another.

One notable failure should be recorded. Collaboration in political warfare with the Soviet Union was never achieved. The Political Warfare Executive strove hard to obtain it. After long negotiations the Soviet Government agreed to co-operation in London, but not in Moscow, and deputed a senior member of its London Embassy and a general to represent it. They were immediately admitted to the top Anglo-American committee. They attended three meetings. The general was polite, co-operative, and helpful. The diplomatist kept his lips sealed. Then, without any notice of withdrawal, they never returned. Later it was learnt that they had been recalled to Moscow.

ADVANTAGES AND LIMITATIONS OF POLITICAL WARFARE

An assessment of the value of the Political Warfare Executive's contribution to the war effort is a difficult task, because even expert opinion is divided on what is, and always must be, a controversial subject. At the beginning of the war the Service Departments were sceptical. To the end some of the senior commanders remained sceptical, especially in Bomber Command, which was inclined to regard the carrying of leaflets as a waste of effort and an added danger to bomber crews. On the other hand, the younger senior officers took a keen interest from the first, and in the later stages of the war were perhaps inclined to exaggerate the possibilities of political warfare. It is probably true to say that in all three Service Departments there were enthusiasts, sceptics, and middle-of-the-road moderates who gave support but reserved judgment. The same divisions of opinion existed in the Foreign Office.

As regards Germany, the Political Warfare Executive's task, both in its white and black propaganda, was to demoralise the enemy, to imbue the German people not only with anti-Nazi sentiments but also with a desire for peace and a return to a more liberal form of government, and to create confusion both at the front and in the rear. To achieve these aims, various techniques were used. There were special broadcasts to the German workers. Another successful technique was to commit the enemy to military objectives which appealed to the enemy public but which we knew his armed forces could not fulfil. This form of political warfare required accurate military intelligence, and here the liaison with the Service Departments was invaluable. By the dissemination of faked orders, invented rumours, and other ingenious methods which cannot be described here the black propagandists sought to create confusion in the smooth working of the German military machine.

There were many pitfalls for the white propagandists, for demoralising and deceiving the enemy had to be achieved without demoralising and deceiving the fighting forces of the Allies. For instance, it was impossible after every slight setback to the German advance to say that the German troops were fighting badly or were composed of raw and unwilling recruits. This angered our own troops in the front line who, knowing the strength

of the opposition, rightly regarded this form of propaganda as a reflection on their own fighting qualities. Such early mistakes were soon corrected and are quoted here merely as an example of the difficulties to which political warfare is constantly exposed.

It is now known that the broadcasts to Germany were eagerly listened to by the German people and, indeed, by many German officers, and that the black propaganda succeeded more than once in misleading the German High Command. Long before the end of the war the German people were convinced of the inevitability of defeat, and in the creation of this conviction the Political Warfare Executive is entitled to a modest share. Nevertheless, if the yardstick by which the success of political warfare is to be measured is its part in softening the resistance of the enemy and thereby easing the task of the armed forces, it has to be admitted that in the last war the Germans continued to fight and to prolong a hopeless struggle far beyond the surrender stage of 1918.

There were, of course, other reasons for this resistance to the last Berlin bunker. There was, for instance, the highly controversial issue of the Allied policy of "unconditional surrender." Opinion on its advantages and disadvantages is still divided. What is certain is that Goebbels exploited the formula to the full by telling the German people almost daily: "You may not like us Nazis, but God help you if we are defeated and you have to accept the peace terms which the Allies will inflict on you."

A still stronger reason for the prolongation of German resistance was Hitler's knowledge that defeat was his own end. A calculated surrender had therefore no attraction for him. Had the German Army been in full control it would doubtless have sought to preserve itself, but its power had long been undermined from within and its only effort to assert itself politically was the feeble attempt on Hitler's life in July, 1944.

Italy was a more profitable field for political warfare, for here the formula of "unconditional surrender" was interpreted more liberally. In North Africa and in Italy itself the Italians responded readily to surrender propaganda, and the political warfare experts in the field won praise from both General Eisenhower and Field-Marshal Alexander.

It was, however, in the enemy-occupied countries that the Political Warfare Executive had its greatest success. Inevitably the results varied, but in a war in which the oppressed peoples were cut off from all contact with the West, radio was of paramount importance in keeping them informed of what was happening and in fostering the certainty of ultimate victory. The broadcasts from London were heard with an eagerness which was realised even during the war by the increasingly severe penalties which the Germans imposed on listeners.

In Western Europe the underground movements grew progressively in strength, worked in close collaboration with the Allies, and co-ordinated their efforts with Anglo-American strategy. Physical contacts were well maintained, and escapes and visits to England brought valuable information and fresh recruits to us. More than once General Eisenhower paid official tribute to the part played by the underground in Western Europe both before and during the invasion. The credit for this achievement belongs to the underground movements themselves and to other British and American organisations, but the Political Warfare Executive per-

formed a useful if subsidiary part in transmitting messages and instructions by open and secret radio.

Secret communications with the Polish and Czechoslovak underground organisations were well maintained until the approach of the Soviet armies, although the assassination of Heydrich in Czechoslovakia caused a serious interruption because in their anger the Germans arrested so many people that the elaborate cells of the underground were ruptured.

The Balkans were on the whole an unfruitful field. In Hungary, Rumania, and Bulgaria fear of Russia was even stronger than the dislike of Germany. In Yugoslavia and Greece it was, in the early years of the war, the policy of the British Government to give arms and support to any groups, including Communist groups, which were prepared to resist the Germans. Inevitably civil factions broke out, and in this maze of confused conflict policy itself hesitated and the task of political warfare became almost impossible.

Long before the end of hostilities the advance of the Soviet armies nullified such minor successes as political warfare had achieved in Central and South-Eastern Europe, where Greece alone remained free from Soviet domination. In this connection it is important to realise that political warfare cannot run counter to official policy. It is the proper function of the exponent of political warfare to use his ingenuity, skill, and special knowledge to interpret official policy in terms of political warfare. It is his first duty to keep his output within the framework of official policy and to ensure that he makes no divergence from it which may commit or embarrass the Government.

As an organisation the Political Warfare Executive suffered from many defects. It was built from broken pieces which never quite fitted. Dependent on the Foreign Office and the Chiefs of Staff for guidance and advance political and military information, it had in a sense two masters, and in some quarters there is to-day a strong feeling that political warfare should come under the control of the Ministry of Defence. This view is also held by the American Army, which has already restored its political warfare department and is conducting political warfare on a large scale in Korea.

Strategy, however, is also the handmaid of government policy, and in this country it is difficult to imagine a divorce between the two. During the war the Political Warfare Executive had its own military wing, and its relations with the Foreign Office and the Chiefs of Staff were harmonious and satisfactory. Its greatest handicap, however, was the fact that it had frequently to act on its own initiative. On many occasions there was no time to consult its two Ministers, both of whom were fully occupied with their more important functions. In any future Political Warfare Executive the best solution would be, in this writer's opinion, a whole-time Minister with a senior Foreign Office official and a senior military officer as his assistants.

By the end of the war the Political Warfare Executive had become reasonably efficient and had justified its existence. It had learnt a great deal and had trained a considerable number of valuable experts. When all was over, the organisation was immediately disbanded, presumably on the ground that in times of peace political warfare is a contradiction in terms.

THE COLD WAR

Although the personnel of the Political Warfare Executive was dispersed, political warfare continues; for the cold war, which began soon after the last war and, indeed, on the Soviet's side, even before it ended, is by its nature political warfare. The weapons with which it is fought and the aims which it seeks to achieve are essentially the same as in a military war.

It must be admitted frankly that in the cold war the Iron Curtain countries possess certain advantages over both Britain and the United States. There is a single and undisputed authority in Moscow which formulates policy with the certain knowledge that it will be followed by the Communist satellite countries with the unquestioning obedience of fear. In addition to broadcasting in a multiplicity of languages, the Soviet Government can and does send newspapers written in the appropriate language into Western countries. In these countries it has correspondents and official agencies like Tass which can and do send back to Moscow a stream of biased information.

In its radio campaign—and radio is the chief weapon of the cold war—the Soviet Government has constantly increased its output until in March, 1951, it was broadcasting to Western Europe alone 320 hours a week. To this figure must be added the 442 hours a week broadcast to Europe by the Communist satellite countries. In addition, the Soviet Government spends large sums on jamming or trying to jam broadcasts to the Iron Curtain countries from the West.

The Soviet Government wages the cold war with venom, vituperation, and intensive vigour. In its campaign against the West it seeks to drive a wedge between the Americans and the Western Europeans, to divide opinion in individual countries, and, above all, to persuade the peoples of the West that their governments are dragging them into a third world war and that peace can be assured if only they will take the law into their own hands.

To its own people the Soviet Government repeats daily the warning that the West is preparing to attack the Soviet Union. At the same time it emphasises the invincible strength of the Soviet armed forces and asserts that the collapse of American capitalism is not only inevitable but also imminent. These arguments are buttressed by deliberate falsifications. The peoples behind the Iron Curtain are told that not only did the Soviet Union win the war by its own unaided efforts but also that the Western Allies did everything possible to help Hitler even to the length of trying to make a separate peace with him. Although co-existence with the bourgeois countries is mentioned occasionally, the whole trend of Soviet propaganda is to promote the triumph of Communism and to convince as many people as possible that only the Communists can give a lasting peace to the world.

Both Great Britain and the United States maintain a counter-offensive to Soviet political warfare. It is confined almost entirely to broadcasting mainly because of the difficulty of penetrating the Iron Curtain by any other means. Moreover, a democracy encounters serious obstacles in conducting political warfare in times of so-called peace. In war there is national unity and a single policy. In peace there is a return to party

politics, and party politics mean divided opinions which provide the totalitarian propagandists with valuable material. In war political warfare is closely connected with military operations. It works to a fixed timetable. In the cold war there is an uncertain and unpredictable future, and in broadcasting to countries like Poland and Czechoslovakia, where opposition to Communism is strongest, the propagandist must be careful not to raise premature hopes. He has the difficult task of keeping the spark of hope alive without blowing it into a flame. Moreover, he has to bear in mind the Western desire for peace and to keep the door open for a possible understanding with the Soviet Union.

In its conduct of the cold war the United States relies on two broadcasting organisations : "The Voice of America," which is controlled by the State Department, and Radio Free Europe, an independent organisation which broadcasts from Munich and which is supported by private funds. At present "The Voice of America" is broadcasting 367 hours to Iron Curtain countries. This total must be subdivided into 82 hours of original broadcasts and 285 hours of repetitions. The output follows the main lines of United States foreign policy, but it suffers considerably from the somewhat violent criticism of travelling Senators.

Radio Free Europe broadcasts mainly to Poland, Czechoslovakia, and Hungary, although there is also a minor programme for Rumania and Bulgaria. The purpose of Radio Free Europe is to allow Polish, Czechoslovak, and Hungarian *émigrés* to speak freely to their countrymen behind the Iron Curtain. Unhampered by official controls, it can and does speak with greater freedom, but it, too, has to bear in mind the inevitable depression which follows the raising of hopes that cannot be fulfilled. At present Radio Free Europe is broadcasting 300 hours per week. This makes a combined total of 667 hours of broadcasting per week for the Americans to correspond with the combined Soviet and satellite total of 762 hours per week.

In its conduct of political warfare Great Britain enjoys one considerable advantage and suffers from one serious deficiency. The European Services of the B.B.C. has the most experienced and best trained staff of experts and retains its high reputation for reliability. In its output it exposes the frequent inconsistencies and lies of the Soviet and satellite press and radio. It expresses the British desire for peace and understanding and contrasts the British way of life with the police states behind the Iron Curtain. In its output it uses both facts and ridicule. It does not indulge in abuse and raises no false hopes. It tells the truth and is therefore listened to eagerly in all the Iron Curtain countries, including the Soviet Union.

The deficiency from which the B.B.C. suffers is lack of funds not only for capital investment in much-needed new equipment but also for running expenses. The need for economy is fully realised, and it is an obvious truism that the value of broadcasting is to be estimated by quality and not by quantity. But with rising costs and "cuts" in the Treasury grant the output of the European Services of the B.B.C. is being dangerously curtailed. Official apologists for the "cuts" maintain that broadcasts to Iron Curtain countries are not affected. The truth is that the economies affect the whole service which for its material depends almost entirely on Iron Curtain newspapers and on the excellent British monitoring service.

The newspapers may be stopped at any moment ; the monitoring service has already suffered, and out of the reduced Treasury grant large sums have to be spent on counteracting the elaborate system evolved by the Soviet Government for jamming B.B.C. broadcasts. These and other measures taken by the Soviet Government to prevent the B.B.C. from reaching the Soviet people are in one sense a tribute to the efficacy of the broadcasts. On the other hand, the extra expense involved in counter-jamming is curtailing B.B.C. output, and the unpleasant fact remains that since the "cuts" of February, 1952, the B.B.C. is broadcasting only 60 hours a week to Iron Curtain countries. Compared with American and Soviet hours, the British figure is too low.

If political warfare is to be regarded as an essential part of the British defence system, the economies may well prove costly. In broadcasting as in other walks of life there is no standing still. It must either go forward or go back. British broadcasts to Iron Curtain countries are receding, and at the time of writing (March, 1952) there is a real danger that the battle for ideas in Europe—and it is for ideas that the cold war is being fought—will be left by British default to the Americans and the Russians.

R. H. BRUCE LOCKHART

CHAPTER VIII

THE DEFENCE FORCES OF THE REPUBLIC OF IRELAND

Historical Background

THE IRISH Nation came into being under the Irish Free State (Agreement) Act, 1922, as a co-equal member of the British Commonwealth. The new Irish Free State (in Gaelic, *Saorstát Éireann*) included the whole of Ireland except for six counties of the province of Ulster. The Constitution, issued by the Crown on June 16, 1922, gave to the Free State Parliament the exclusive right to raise, maintain, and control armed forces within the national territory, and stipulated that the Irish Free State should not be committed to active participation in any war without the assent of its Parliament, save in the case of invasion. As Head of the State, Michael Collins immediately began to recruit a Civic Guard (*Guarda Siochana*) to replace the disbanded Royal Irish Constabulary; and General Richard Mulcahy became the first Minister of Defence and started to organise a Free State Army to take over from the British forces which had hitherto been stationed in the south of Ireland. Michael Collins himself was the first Commander-in-Chief of the Free State Army until August 22, 1922, when he was killed in the Civil War which ensued between the "Free Staters" and the Republicans led by Mr. Eamon De Valera, who refused to recognise the separation of the Six Counties of Ulster from the rest of the country.

Ten years later Mr. De Valera's party was elected to power; and in 1937 the Constitution was revised. The Free State was then redesignated "Eire," its Executive Authority ceased to be vested in the King, and the Office of Governor-General was abolished; though, by the External Relations Act, certain British control in external affairs was still acknowledged. Eire exercised her right to remain neutral during World War II, but a state of emergency was declared and, by the Emergency Powers (No. 61) Order, 1940, Local Forces (*Forsa Cosanta Aituit* or *F.C.A.*) were mobilised to assist the Regular Army in the event of invasion.

After the war Mr. De Valera's party was between 1948 and 1951 replaced by an Inter-Party Government led by Mr. John Costello. The External Relations Act was then repealed, and the Republic of Ireland Act came into force at midnight between August 17 and 18, 1949. The State is now designated "The Republic of Ireland" (*An Poblacht na h-Eireann*). It is declared to be a sovereign, independent, and democratic State distinct from, but having a specially close relationship with, the British Commonwealth; and the National Territory is now defined as the whole island of Ireland, the islands, and the territorial seas. However, pending the reintegration of the National Territory, and without prejudice to the Parliament of the Irish Republic (*Dail Éireann*) to exercise jurisdiction over the whole of the National Territory, the laws enacted by that Parliament shall have the like area and extent of application as those of the former Irish Free State. While the Six Counties of Ulster remain under

separate jurisdiction, the Republic of Ireland has declined to join the North Atlantic Treaty Organisation.

After the elections held in May, 1951, Mr. De Valera's party was once more returned to power. The Cabinet portfolio for Defence then passed into the hands of Mr. Oscar Traynor, who also had previously held it during the years of the Emergency. On January 30, 1952, the *Dail* approved the second reading of a new Bill whereby members of the Defence Forces Reserve are prohibited from accepting a commission in, or joining the armed forces of, another State.

The High Command

The Defence Forces comprise the Army, the Naval Service, and the Air Corps. The Peace Establishment for all three Services caters for the following combined totals of all ranks :

Regular Forces	13,200
First and Second Line Reserves	46,000

The actual total of the Regular Forces in 1951 was 7,882 all ranks.

Under the Constitution the President of the Republic, Mr. Sean T. O'Kelly, is titular Commander-in-Chief of the Defence Forces. There is a Council of Defence under the Chairmanship of Mr. Traynor, which consisted of :

- The Parliamentary Secretary to the Minister for Defence—Mr. D. O'Brian
- The Chief of Staff of the Defence Forces—Major General W. G. Egan
- The Adjutant-General of the Defence Forces—Colonel J. Flynn
- The Quartermaster-General of the Defence Forces—Colonel P. A. Mulcahy

The tenure of appointment of the three military members is five years. The Department of Defence (*Ríonan Cosanta*) is located at Parkgate, Dublin.

The Naval Service

This Service is based on Queenstown (Cobh), County Cork, and its personnel establishment is about 650 on Regular engagements. It is commanded by Captain H. J. A. S. Jerome, a recently retired Royal Naval officer. There are three corvettes—*Macha*, *Cliona*, and *Maeve*—which are engaged mostly on fishery protection duties. In 1951 the corvette *Macha* went on a cruise to Spain, the United Kingdom, and France. It was the first time that an Irish Naval vessel had visited Spain and that any foreign warship had paid a courtesy visit to Vigo since the Spanish Civil War. Certain Naval Service personnel have joined cadets' training cruises and sub-lieutenants' courses in the Royal Navy. Reserves are called up for annual training, and are now being sent to sea in the three corvettes.

The Air Corps

The Air Corps was raised in 1922 at Baldonnel. Training is carried out in Chipmunks, Masters and Magisters ; and operational aircraft include

Seafire fighters. Though small, the Air Corps is a very efficient force. The Commanding Officer is Colonel P. Quin.

Organisation of the Army

At General Headquarters are the Army Staffs and Directorates of the various Army and Services. The senior appointments are shown below:

Assistant Chief of Staff	Colonel J. Lillis
Director of Plans and Operations	Colonel D. J. Lawlor
Director of Training	Colonel T. Fox
Director of Intelligence	Colonel R. J. Callan
Director of Engineers	Colonel J. Gleeson
Director of Cavalry	Colonel A. T. Lawlor
Director of Artillery	Colonel J. McLaughlin
Director of Signals	Colonel J. Devine
Director of Medical Services	Colonel T. McKinney
Director of Supply and Transport	Colonel T. P. Gallagher
Director of Ordnance	Colonel J. Delaney
Head Chaplain	The Rev. J. F. O'Regan, C.F.

The rest of the Army is organised in four commands as follows:

<i>Command</i>	<i>Headquarters</i>	<i>Commander</i>
Eastern	Dublin	Colonel S. McGoran
Western	Athlone, Co. Westmeath	Colonel J. Collins-Powe
Southern	Cork	Colonel J. Hanrahan
Curragh Training Camp	Curragh, Co. Kildare	Colonel D. Bryan

The Eastern, Western, and Southern Commands each include, in addition to their headquarters units, a brigade group commanded by a colonel and certain coast defences which until 1938 were garrisoned by the British Army. The Curragh Training Camp contains all the Army training establishments and the depot and school of each corps—including the Equitation School, which trains the world-famous international show jumping team.

Army Recruitment and Terms of Service

Recruitment is voluntary. Men enlist for three years with the Colours and nine on the Reserve. They can, however, extend their service for three years at a time up to twenty-one years, when they qualify for a pension. The basic training at the recruits depot lasts for six months, and recruits then move over to their corps depot for technical training before being posted to units. Units do not normally change station, so it is thus possible to serve continuously at one place except while attending courses. It is unusual for any man to be cross-posted between units except at his own request. Since January, 1951, the minimum pay for a recruit has been £2 per week. At present the Army has about 4,000 N.C.O.s. and men fewer than its establishment.

On the other hand, applications for commissions usually number three or four times more than the available vacancies. Potential officers must have reached a suitable educational standard, which includes passing a test in Gaelic. Officer-cadets do not serve in the ranks; but after passing an interview by a Regular Commissions Board, they go straight to the

Cadet College, where they undergo a two-year course before being commissioned. Both single and married officers are paid at rates approximately 25 per cent. less than the rates in the British Army. Time-scale promotion is two years from second-lieutenant to lieutenant, and an additional eight years to captain. Promotion above the rank of captain is by vacancy.

There is no religious bar: on the contrary some 5 per cent. of the officers and 10 per cent. of the other ranks in the Army are not Roman Catholics, as compared with 6 per cent. of the population of the Republic of Ireland as a whole.

Insignia and Medals

Like the United States Army, the Irish Army wears a universal cap badge regardless of Arm or Service. The badge includes the Gaelic inscription *Oglaih na h-Eireann* (the Flower of Irish Youth) and the entwined letters FF, which stand for the Gaelic *Fianna Fail* (the Sons of Destiny). The name *Fianna* was originally given to the military organisation founded by the legendary Finn MacCumhaill in the third century: the word *Fal* (genitive *Fail*) is connected with ancient Gaelic mysticism and with the *Lia Fail*, or Stone of Destiny, which was brought to Ireland by pre-Gaelic invaders and which later is reputed to have found its way to Scone—whence it was transferred to the Coronation Chair at Westminster.

Links with the more recent Easter Rising of 1916 and Anglo-Irish War of 1919–21 appear in the initial letters IV (Irish Volunteers) on the uniform buttons and in the rank of commandant (equivalent to major) which perpetuates the title of the old column commanders, of whom Mr. De Valera himself was one. A curious departure from tradition is that the Irish Army bands play the Scottish type of bagpipes with three drones, whereas the old Irish war-pipe had only two.

Distinction between Arms and Services is made by the various collar badges; and where these are worn in pairs they face outwards and not inwards as is the usual custom. Certain officers' appointments are distinguished by coloured backing in their badges of rank as follows:

Red	G.H.Q. Staff
Yellow	Divisional Staff
Green	Brigade Staff
Blue	Command Staff, of an Area as opposed to a Formation
Orange	Instructional Staff

The badges of rank of general officers are embroidered in gold upon scarlet silk and set upon a scarlet ground; for other officers they are of bronze. Colonels and above wear gold leaves around the peaks of their caps.

The following medals have been instituted for the Defence Forces:

Easter Rising (1916) Medal consists of a star-shaped reproduction of the Army cap badge, with the initials FF in the centre replaced by a replica of a statue erected as the 1916 memorial in the Dublin General Post Office. There is a chased bar at the top of the ribbon, which is half orange and half green.

General Service (1916-21) Medal has a ribbon half black and half khaki, which is no doubt associated with the British para-military police, recruited for service in Ireland after World War I, who were known from the colour of their uniforms as the "Black and Tans."

Emergency Medal (1940-45) was issued to all who were mobilised during the emergency. The ribbon is red and white.

Military Medal for Gallantry is awarded for gallantry not on active service. The ribbon is green with a crimson border.

Forsa Cosanta Aituil

The *F.C.A.* corresponds to the British Territorial Army and is the continuation of the Local Defence Forces raised during the emergency. There are the equivalent of approximately 100 battalions spread over the country in platoons and companies. During 1951 nearly 5,000 First Line and 20,000 Second Line Reserves were called up for annual training. The Director of the *F.C.A.* is Colonel C. J. Donohue.

Progress and Training

The circumstances in which the Army came into being at the end of 1921 have already been described. To bolster up the unarmed Civic Guard during the Civil War, the Government was obliged to enrol large numbers of troops, which eventually totalled more than 50,000, including some fifteen generals. This hastily levied force, with officers for the most part as untrained as the men, was better suited to partisan activity than to peacetime soldiering: however, steps were soon taken to refashion it on modern lines.

The development of the Irish Army is well illustrated by the contents of the Army journals *An t-Oglac* and, latterly, *An Cosantoir*. In *An t-Oglac* of April, 1923, there is an editorial admonition: "If you have a chronic cough, do not spit on the floors of corridors, rooms, or even stables"; while, in contrast, the editor of *An Cosantoir* dated October, 1949, draws attention to an article about "The problems of V2 development 1944-45." Furthermore, in *An t-Oglac* of May, 1923, we read in the editorial: "It is for us all to see that the National Army of Ireland should be an Irish Army in every sense of the term. The difference between an Irish soldier and an English soldier goes in, and should go in, deeper than the uniform." But within nine years articles were being contributed by retired British officers, such as Senator Lieut.-Colonel The McGillycuddy of the Reeks, D.S.O., in September, 1931, and Brigadier-General R. E. Solly-Flood, C.B., C.M.G., D.S.O., in April, 1932.

Prior to 1939 twelve Irish officers were sent on courses to the United States, and one to France; only a small number went to England. After World War II, however, there started a constant flow of officers to attend courses in the United Kingdom, including the Staff College, Camberley. During 1951 no less than twenty-nine officers went abroad on courses; on their return they are usually posted to the Curragh as instructors. To-day training is based almost entirely upon British methods and British manuals. Instruction is in English; but in deference to the first official language of the Constitution, words of command are given in Gaelic. Military discipline is administered under similar

Rules of Procedure to those of the British Army, but the Army Act is replaced by the Defence Forces Act.

Every effort is made to keep the Army abreast of modern techniques. An "Army Week" is held annually at the Curragh in the summer, and Army units send teams to take part in small-arms competitions and other sporting events. Also in the summer the field artillery fires at the annual practice camp. In 1951 a large-scale exercise was held for three days in an area north of the River Boyne, where three brigades, supported by aircraft from the Air Corps' No. 2 Base at Gormanstown, repelled a force of airborne invaders. In this exercise the Regular units were reinforced by Reservists undergoing their annual training.

Value for War

As is the case in most countries outside the Iron Curtain, the scope of the Defence Forces of Ireland is limited primarily by shortages of money and equipment. In July, 1951, Mr. Oscar Traynor estimated that the Department of Defence would require the sum of £5,076,870—a comparatively modest sum, but one which nevertheless represents an increase of some 25 per cent. over the estimates for 1950. At the same time he gave notice of an intensive recruiting campaign to bring the Defence Forces up to their authorised establishments.

The Army's equipment is at present almost entirely of British origin. It includes Churchill tanks, Daimler armoured cars, 25-pdr. field guns, 17-pdr. anti-tank guns, 3·7-inch anti-aircraft guns, and some of the latest wireless sets. Present resources are not sufficient for a modern and balanced field force, to which the present small but efficient cadre would need to expand in the event of war. There being no armament or munition factories in the Republic, the necessary equipment will have to be imported from abroad. The N.A.T.O. countries are, of course, fully occupied with their own rearmament; so they have at present little or nothing to spare for nations outside the Pact. This is no doubt why in 1951 the Irish Army sent two senior officers—the Director of Plans and Operations together with the Director of Ordnance—on a buying mission to Sweden. No details have so far been published about the items requested or ordered, but the *Irish Times* has surmised that modern anti-aircraft equipment had high priority on the Irish Army's shopping list.

The inherent fighting qualities of Irishmen need no advertisement, but for many years they gained their honours outside their own country. Field-Marshal Peter Lacey of Russia, Marshal Patrick MacMahon of France, Field-Marshal O'Donnell of Spain, and Field-Marshal O'Reilly and Taaffe of Austria are but five Irishmen who have achieved fame in the service of other nations; the same number of field-marshals of Irish birth or breeding played prominent parts in World War II. At lower levels, too, some 200,000 Irishmen, who voluntarily reinforced the Allied war effort, furnished many stirring examples of gallantry and enterprise in the tradition of those fine regiments now disbanded—the Connaught Rangers, the Royal Munsters, and the South Irish Horse, to name but three of these famous units. To-day, given the time and equipment necessary for expansion and for training in the latest military technique, there is no doubt that the Defence Forces of the Republic of Ireland would give a good account of themselves.

"ROGER EASY"

CHAPTER IX

SUPREME ALLIED HEADQUARTERS, EUROPE

Before studying the organisation of the Supreme Headquarters Allied Powers, Europe—short title S.H.A.P.E.—it is as well to review briefly the developments, already set forth in detail in the 1950 and 1951 issues of “Brassey’s Annual,” which brought this body into existence.

The 1939–45 world war came to an end with the unconditional surrender of Germany. Germany as a political, economic and military unit ceased to exist; what was once her territory was occupied by the four great powers Great Britain, the United States, France, and Russia. Thus it appeared that the menace of German militarism had been crushed for ever. It seemed only common sense to envisage a quick and considerable reduction in the forces of all the powers who had been engaged in the conflict.

As far as the three Western powers were concerned this took place, and once again, as after World War I, the nations of the world subscribed, in the United Nations Organisation, to the principle of collective security against aggression. All seemed set fair for the peace of the world until the actions of Russia, both in the United Nations Organisation and outside it, shattered that dream. The continued use of the “veto” by Russia in the Security Council soon paralysed that body; and outside, the attitude of Russia gave cause for very great concern. It will be remembered that the three western powers in 1946 offered Russia a forty-year guarantee against German aggression in any form. This offer was refused. Instead Russia maintained her armed forces at full strength and geared a percentage of her industry, variously estimated at between 20 and 60 per cent., to her armament industry. Not content with that, she proceeded to absorb the Baltic and Balkan states which marched with her frontiers.

It is interesting to observe how this was done. First Russia negotiated treaties with the Governments of these states whereby they were bound to come to her assistance in the event of aggression by Germany, while she in return promised to help them should they be attacked. On each occasion as part of the treaty Russia insisted that she should have the guiding voice in foreign policy and internal security, which, of course, made it easy for her to take over the reins of government of the signatories whenever she felt inclined to do so. This, of course, meant only one thing. Russia was embarking on a policy of expansion just as Hitler had done when he came to power in 1933.

By the beginning of 1948 this policy was only too clear. The attitude of Russia in the United Nations Organisation and in the Quadripartite Council in Berlin, where it was quite obvious that she was not acting in unison with them, caused great uneasiness to the Western powers. This state of tension came to a head when a Communist minority in Czechoslovakia, backed by Russian military force, overthrew the democratic government of that state.

WESTERN UNION

This convinced the Western powers that the time for action had come. The first action taken was the signing of the Treaty of Dunkirk between Great Britain and France. Close on its heels came the Treaty of Brussels, whereby Belgium, the Netherlands, and Luxembourg joined the pact with the object of providing mutual assistance should any of the signatories be attacked. This latter treaty had as a natural consequence the formation of the Western Union Defence Organisation to "give it teeth." Field-Marshal Viscount Montgomery was appointed chairman of this organisation, and a headquarters staff was set up in London, with a planning staff at Fontainebleau, near Paris. This was the first step to put the ideal of collective defence into action.

But hardly had this organisation come into being when Russia gave another proof of aggressive policy. She instituted the blockade of Berlin. The object of this was to make it impossible for the three Western powers to maintain their forces in the German capital. Had these forces been withdrawn it is only reasonable to suppose that not only Berlin but the whole of western Germany would have come under Russian control. The blockade of Berlin was countered by the "Berlin Air Lift" organised by the United States and Great Britain. As soon as Russia saw that this was successful the blockade was lifted. However, all this brought home to the Western powers the fact that Russian aggression was a very real danger.

NORTH ATLANTIC TREATY ORGANISATION

The result was that on April 4, 1949, the North Atlantic Treaty was signed at Washington between Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, and the United States. These twelve nations (now fourteen, by the inclusion of Greece and Turkey) under Clause 51 of the United Nations Charter banded themselves together to promote the stability and well-being of the North Atlantic area while re-affirming their desire to live in peace with all peoples and all governments. In clause 5 of the North Atlantic Treaty is found a statement that "an armed attack against any one member would be considered an attack against all." To make the treaty effective the North Atlantic Treaty Organisation was established. The details of this are shown in Diagram I. (It is important to note which groups are in permanent session.)

The North Atlantic Council consists of the Foreign Ministers of the signatory powers and is the directing body of the Organisation. To overcome the fact that it is not in permanent session the Council of Ministers' Deputies is permanent, with its headquarters in London. Working under the above councils, besides the Military Branch, with which this Chapter deals, are a Defence Production Board and a Financial and Economic Board.

At the head of the military side of the organisation is the Military Committee, not in permanent session, composed of the Chiefs of Staff of the treaty powers; it is responsible for advising the Council on military matters. Under the Military Committee was set up in Washington the Standing Group, composed of representatives of the Chiefs of Staff of the

United Kingdom, France, and the United States—reminiscent of the “Combined Chiefs of Staff Committee” of the last war. The Standing Group is responsible for higher strategic direction throughout the area covered by the North Atlantic Treaty and can give instructions and guidance on military matters to any naval or military command established therein. Thus the Supreme Allied Commander in Europe is shown as coming directly under it.

In order that the views of countries not represented in the Standing Group should be properly represented, a “Military Representatives Committee” was also established in Washington. The planning of the unified defence of the original member states was divided into five Planning Groups, viz.:

Northern European
Western European
Southern European—Western Mediterranean
Canadian—United States
North Atlantic Ocean

Hardly had these various groups come into being than the Russian-inspired aggression in North Korea took place in June 1950. This clearly demonstrated that strong action to give effect to the decisions of the whole organisation was both urgent and imperative. On September 18, 1950, the North Atlantic Council met in New York and agreed that an inter-allied, integrated force should be established in the most threatened area—Europe—as soon as possible, and that an integrated allied command should be set up in Europe. The first step was to select the Supreme Allied Commander, and the unanimous choice was General of the Army D. W. Eisenhower (U.S.A.), who had won the confidence of all when Supreme Commander North-West Europe in the last war. Accordingly he was appointed to the post on December 19, 1950, and held it until May 30, 1952, when he was relieved by General Matthew Ridgway.

SUPREME HEADQUARTERS ALLIED POWERS EUROPE

The next thing to do was to establish the Supreme Commander's headquarters and to provide and organise the staff. Shortly after his appointment General Eisenhower arrived in Paris with a small staff and set up temporary headquarters in the Astoria Hotel. It was during this visit that the Supreme Commander decided on the site for his permanent headquarters. The final choice fell on the vicinity of a small village called Marly le Roi, some twelve miles outside Paris and where the French President had shooting preserves. Here an area of about sixty acres was offered by the French Government. On this in a very short time a number of light prefabricated buildings were erected, the main offices situated in ten parallel wings connected by a long corridor, with sleeping quarters for officers and other ranks who are quartered on the site grouped around the main building. On July 23, 1951, President Auriol handed over the completed structure to the Supreme Commander.

THE SUPREME COMMANDER'S TASK

The task assigned to General Eisenhower was to build up and weld together the forces of the North Atlantic powers in Europe into an integrated force strong enough to deter any potential enemy from aggression.

As a natural result of this he had also to prepare defence plans so that these same forces may fight from the beginning of any war under the most favourable terms. Directions for the Supreme Commander emanate from the Standing Group (Diagram I). He has the right of direct access to the Chiefs of Staff of any of the powers in the North Atlantic Treaty Organisation. As was the custom in the last war, he can in exceptional circumstances refer to the Defence Ministers and even the heads of governments. It is also one of his most important functions to make recommendations to the Standing Group concerning the adequacy and training of his forces or any other military matter which affects his ability to carry out his responsibilities in peace or war.

COMMAND OF FORCES

The Supreme Commander, as his title infers, exercises his command over the forces placed at his disposal by virtue of the fact that the nations belonging to the Atlantic Pact have bound themselves to a common security effort. This power, although in theory confined to the military sphere only, must of course also involve political and economic factors. Budgetary control remains in the hands of the Financial and Economic Board (Diagram I) as far as the forces allocated to the command are concerned. The forces themselves are detailed by the powers on a voluntary basis. It stands to reason, therefore, that the Supreme Commander must impress on the governments concerned the need for the forces, and in this his personality and reputation, which inspire confidence, are a prime factor.

THE MILITARY SITUATION

It is an accepted fact that Russia by her actions has established herself as the only power that threatens the peace of Europe. Consequently planning must be directed with Russia as the potential aggressor. Western Union had also concerned itself with preparing plans which envisaged the invasion of western Europe by vastly superior forces from the east. Considerable progress was made along the lines of developing a common doctrine among the five nations who signed the Brussels Treaty. To achieve this, plans for mutual assistance formed a great part of the study of the problem. With the advent of the Supreme Commander and his inter-allied staff, all the records of the deliberations and plans which had been made previously were at once made available to the Supreme Headquarters Allied Powers, Europe. In addition Field-Marshal Viscount Montgomery was appointed Deputy Supreme Allied Commander.

Diagram II shows the commands which have been decided on, whence it is at once apparent that central Europe is by far the most important sector. A map shows at once the reason for this. The main operations for the defence of western Europe must be carried out in the central sector. Europe is roughly a peninsula with the sea on its north and south boundaries. In central Europe lie all the countries directly menaced by aggression from the east. Here are all the industrial centres on which the armies in the field must depend, which must not be allowed to fall into enemy hands. Here it is reasonable to suppose that the great land and air battles will be fought if war breaks out. From Diagram II it is apparent that the Supreme Commander will exercise control over the commanders for

central Europe. Their headquarters are situated at Fontainebleau, not far from Marly le Roi.

The commands of the flanks, being in the nature of naval and air flank guards, have been given to naval officers Admiral Brind (U.K.) at Oslo and Admiral Carney (U.S.) at Naples. The use of naval and air forces on the flanks should enable the Supreme Commander to force a decision in the centre by denying the enemy egress from the Baltic and the Black Sea. The position of Yugoslavia on the flank of any Russian advance seems to call for action to incorporate that country into the defence plan.

STAFF OF THE SUPREME COMMANDER

The details of the Supreme Headquarters Staff are shown in Diagram III. One would think that for a staff of such eminence the numbers would be large; this, however, is not the case. Actually it numbers approximately 300, of which the largest proportion is provided by the United States (140). Next in size are the British contingent (70), and the French (50). The remainder is made up of officers from the other nations of the North Atlantic Treaty Organisation, with Luxembourg providing one. The two official languages are French and English, and all officers are expected to speak both.

The staff is fully integrated, and it will be seen from the diagram that key positions are held by various nationalities. With the experience of his successful wartime headquarters as a guide, General Eisenhower worked on the principle of co-operation rather than by the dominance of any one nation. The result has been remarkable; not only is there a happy atmosphere in the staff but General Eisenhower was able to declare publicly that so well had contributor nations chosen their personnel that "the character of the officers and their ability has been beyond all expectation." One might have expected that this might have been otherwise with so many different languages and so many different points of view. That it is not speaks well for all concerned and is a good augury for the future. Perhaps in the creation of this happy state of affairs a contributory factor is the provision of an "All Ranks Cafeteria" at the Headquarters. This is in constant use by all ranks, and at least once a month all officers from the Supreme Commander downwards dine together in the Officers' Restaurant.

Unique to the Supreme Headquarters is a section called "Executive, National Military Representatives." Since the duty of the staff is to plan and think internationally for a number of sovereign states, there must be some method whereby the national viewpoints of these states are represented. In the section referred to above there is an officer from each country who acts as liaison between his ministry or government and the Supreme Commander. He is not a member of the staff as such and presents his nation's views and requests (or vice versa) through the office of this section. Thus no country can feel that its national views are neglected, while no member of the S.H.A.P.E. staff has to think along national lines. This works very well in practice.

CONCLUSION

The task this headquarters has to perform is not only vast but complex. It is also novel. Put shortly, it is to weld and train the fighting forces of fourteen nations into a single force which can *act swiftly and as one* in the

event of war. At the same time it has to prepare plans which have as their object the employment of this force in the most efficient manner to protect that part of Europe west of the Iron Curtain. Since the forces of Russia are already on a war footing and have been under centralised direction for a long time, the menace is clearly great. Moreover, since Russia is always working on interior lines while the North Atlantic Treaty forces have first to be built up, then trained, and the major part transported across the seas to the Continent of Europe, it seems that the scales are very heavily weighted.

The great work done by the Supreme Commander and his staff, however, has already brought a new confidence to the free world. One reads almost every day of inter-allied inter-service exercises taking place not only in Europe but as far apart as the Caribbean Sea and the Mediterranean. This is proof positive that even in the short period of the command's existence co-operation and co-ordination are taking place on a scale which has never been seen before among nations.

The gap between Russian strength and Allied weakness is a long way from being closed yet. But as each day passes this gap is being lessened. The deterrent to Russian aggression is growing, and even in the short time since the Supreme Commander was appointed that deterrent is beginning to look formidable. This is largely due to the work done by the Supreme Headquarters under the guidance of General Eisenhower, a man proved in war, and who has the confidence of all the member nations of the North Atlantic Treaty Organisation; the same is true of his successor, General Ridgway. In another year's time the Supreme Headquarters Allied Powers should have produced an instrument which will make aggression unprofitable from the start.

H. E. HORAN

CHAPTER X

THE FUTURE OF THE AIRCRAFT CARRIER

WITH OUR newest and largest aircraft carrier, the *Eagle*, now in full commission, and with the United States Navy building three super-carriers, it is worth while attempting an estimate of the future employment of these great ships in a possible world war. The success which attends a particular weapon in one war will not necessarily be repeated in another. Yet over and over again history shows that this lesson is forgotten. The pre-eminent position of the battleship in World War I is an example, for in the succeeding years naval policy and tactics continued to evolve round it as the capital ship—to the detriment of the aircraft carrier and naval air power generally. Now the successes of the memorable carrier battles in the late Pacific campaigns appear to be leading some enthusiasts to believe that there is little or nothing the carrier and its aircraft cannot achieve provided they are big enough.

There are two questions in particular which should always be asked when assessing the future value of a weapon that has proved successful in the past. First, have conditions materially altered? Secondly, does the intended use of the weapon continue to conform to the principles of war? It is in the light of these two points that the future of the aircraft carrier will be discussed.

When in 1910 Lieutenant Ely, U.S.N., took off from a specially prepared surface of the deck of the U.S.S. *Birmingham* at anchor, he was the first man ever to do so. A year or so later, Commander Samson, R.N., achieved the further distinction of being the first man ever to take off from a ship under way. That was from the *Hibernia*. The *Argus*, at the end of the 1914–18 war, can be accepted as our first true carrier, in the form we know that class to-day. Yet from that latter date it took a quarter of a century before we really learnt how to operate carriers efficiently as tactical units of a fleet or task force. That is not to say that many experiments were not conducted; they were, but not frequently or persistently enough nor on a scale to match the shadows cast by coming events. One reason was undoubtedly because the battleship still dominated many minds. That those trials were inconclusive is evident by the fact that even up to the end of 1944 no instructions for the conduct of carriers in a fleet or task force had been formulated and laid down in the official publication. We eventually learnt the lesson from the more air-minded sailors of the United States Navy. A quarter of a century in adapting ourselves to new developments seems a recurring feature in our naval history, as readers of historians such as Mahan will note. It is not the purpose of this article to discuss the obstacles which hindered the pace of our naval education in carrier handling; it is of moment, however, to avoid a repetition by trying to foresee future trends at an earlier stage.

In World War I, the more important engagements were confined to the North Atlantic and Mediterranean with only occasionally skirmishes

against raiding forces or single ships in other seas. While the start of the last war was largely restricted in a similar manner, before long major actions were taking place in all the Seven Seas. In other words, the trend appears to be towards world war in its literal sense. The likely antagonists of a future war being who they are and where they are, it would therefore seem prudent to stand ready for battle in every ocean right from the start.

But how does that influence the role of sea-borne air power in the light of modern developments? The two chief factors to be considered here as having the appearance of most importance are: the increased speed and range of the latest aircraft, and the probable influence of atomic weapons on military strategy.

In the forty-odd years since Lieutenant Ely's historic achievement, the speed of operational aircraft has increased nearly fifteen-fold and is still going up. Range has of course increased in even greater proportion. On the other hand, the speed of ships over the same period has remained virtually the same—and is likely to remain so. Even jet or atomic propulsion cannot be expected to increase it by more than a few knots at most. Modern aircraft are needing ever-longer runways; and in the case of naval versions, much hard thinking and ingenuity is being expended in solving this problem within the confined area of the carrier's flight deck. Yet, whatever success is achieved there, the fact remains that if the carrier force has to move from harbour to operational area or from A to B, our latest jets will still not be able to fly as fast as Lieutenant Ely's aircraft—they will remain hobbled to the speed of the medium that gives them passage. It is like taking a prospective Derby winner five-sixths of the way round the Epsom course in a cart before turning him loose.

INFLUENCE OF ATOMIC WEAPONS

It is impossible for the layman to know what progress has been achieved in the field of atomic weapons, but as there are no security restrictions on imagination, it would be prudent to assume there have been advances—on both sides of the Iron Curtain. To what degree, is an academic question in this context, for the destructive power of even the Hiroshima bomb shows that science has placed in the hands of man powers of devastation that are the nearest approach yet to the cataclysms of nature.

The power of conventional weapons is puny by comparison. Belligerents, if at all evenly matched, manoeuvre on the defensive perimeters of the opposition, feinting, probing, looking for the weak spots. When they lob their shells and bombs into and over those fences, the dents can be quickly beaten out again. To do vital damage, a sustained effort in one or two limited areas is necessary; to achieve that, superiority has to be laboriously built up over a long period. These are the wars of recent decades; wars of attrition that alone make worth while the long-term weapons of attrition: submarine warfare, blockade, propaganda, economic warfare.

But if a weapon is endowed with annihilating power and the objective is as vulnerable as, say, the United Kingdom, the picture alters radically. The perimeter defences on land and sea can be ignored and the blow aimed straight at the vitals. The foul punch is given an advantage hitherto unknown, which points to success being wholly dependent on stealth, treachery, and the placing and timing of those early blows. Customary

methods of defence are also affected, for to defend the immediate vicinity of a vital point that might be pulverised by one bomb invites annihilation of the defenders along with the defended. Gibraltar is one and the Suez Canal another, though perhaps less sound, example. Unless we have some reasonably sure shield against all the physiological effects, to dive into deep shelters may only result, at best, in preserving life at the expense of total immobilisation for an unacceptable period. Some system of outlying defence is called for, if indeed it has not already been foreseen. Recent developments in the United States with the tactical employment of atomic weapons does not invalidate the proposition regarding the weapon when used strategically in its more powerful form.

In a country such as Great Britain not many atomic bombs would thus be needed to wreck the main seats of civil and military government, the chief ports, naval bases, airfields, and arsenals. A few peaceful-looking merchant ships, with the weapon in double-bottoms, dispersed in harbours; a few civil aircraft at airports or above vulnerable centres—all timed to H-hour, possibly to M-minute, of D-day with the arrival of bombers and guided missiles. That first multi-fisted blow might prove so paralysing as to be fatal.

There is no wish to exaggerate. It is admittedly an extreme picture (so was Pearl Harbour), but could it be called impossible with any degree of assurance? What appears to be the chief hope in an apparently grim outlook is that the atomic missile is more of a double-edged weapon than any that have gone before. The consequences of miscalculating that first blow, either in time, place or effect, are so dire as to make the potential aggressor think as he has never thought before. Yet absolute power in some quarters may corrupt absolutely, so that no baseness towards an unsuspecting victim is too vile. "Unconditional surrenders" may father "unconditional wars," in the sense that Geneva Conventions will be totally ignored from the outset. While that may be regarded as too jaundiced a view, it cannot be completely ruled out. However, the likelihood of it never materialising increases in direct proportion to the preparedness of the potential victim, both in military strength and geographical disposition. In the Commonwealth and N.A.T.O. surely lies that hope for us.

If the disadvantages of being peaceful can be offset by preparedness, then speed of retaliation is an essential pre-requisite of that state. A good example is provided by the Korean campaign itself. When without warning, the North Koreans crossed the 38th Parallel with four armoured divisions, there was not a single fighting unit of the United States Army in the country. To back up such forces as General MacArthur could scratch together in Japan from among his occupation troops, the Chief of the United States Air Force ordered the move of five groups of B.39 bombers (about 130) to the front. These were scattered among various airbases throughout the United States and one was in England, but in a few short days they were ready, the bombers and the transport aircraft with all the ground staff. In nine days from that date the bombers were operating in strength from Japan against the enemy in Korea. For those who had come farthest, it was a distance of 9,000 miles. In atomic war, even such swift action may not be swift enough. Therefore only in the aircraft (when backed by solid land and sea power) is this quality of speed sufficiently developed for modern needs. In this connection, however, some

amplification of another aspect is needed, although it is not, again, of relevance here to be detailed.

DIFFERENTIATION OF FUNCTIONS

The use of the term "air power" has caused considerable confusion since its earliest days. That confusion still exists. It is, however, significant that in 1914 second thoughts led to the re-organisation of the Naval and Military Wings of the Royal Flying Corps into the Royal Naval Air Service and the R.F.C.—that each tended to poach on the others preserves does not alter the fact that, officially, separate functions did appear to exist. The last war proved conclusively how right were those second thoughts. The Army cannot operate without its own air component, which it is the function of the Tactical Air Forces to supply. And the Tactical Air Forces cannot efficiently discharge that duty unless there is a thorough understanding of military principles and tactics; in other words, the air-crew need to be as much soldiers as airmen. The early misunderstandings of the war which, slowly resolved, resulted in the far better co-operation achieved at the end bear witness to this. Similar arguments apply to air operation at sea in the case of the Navy and Coastal Command.

In view of what has already been suggested as possible opening gambits of an atomic war, the effective defence of the "homeland" against the enemy's strategic air attacks, and the immediate retaliatory strategic bombing of the enemy's "homeland" are requirements which assume the highest military importance (using "military" in its widest sense). But can these two requirements be regarded as the responsibility of either the Navy or the Army? Not, it is suggested, without their becoming serious distractions to the performance of those Services' respective major roles. If that is accepted, then their prosecution becomes the prime duty of the Royal Air Force; but, in becoming so, it automatically relegates matters affecting the Tactical Air Forces and Coastal Command to second (or third) place. As these two forces are, however, of first moment to the Army and Navy, it is difficult to see how they can, despite the best intentions, receive the necessary priority in planning, training and equipment until complete control is relinquished by the Royal Air Force. It is against this background, then, that a return to the examination of the aircraft carrier's role should be made.

EFFECT OF RECENT DEVELOPMENTS

The carrier task force, with its supporting logistic train, evolved as a complete fighting entity, able to remain in an operational area for long periods. Its mobility and speed of concentration enabled it to move quickly to the operational area. Its aircraft could strike with an accuracy that compensated in some measure for the lack of weight behind their punch. Is the value of those assets still as high to-day?

Mobility and speed are relative terms. Even in the commercial field no two places in the world are now more than 48 hours flying time apart—appreciably less when the Comet airliners are in full operation. The American B.36 is reported to have a range enabling it to strike on the European continent and return to its home base non-stop. Flight refuelling has passed the trial stage. (It will be noted that these points are confined to what is practical today and not what experimental develop-

ments in supersonic flight promise tomorrow.) In contrast, by the time a fleet could weigh and leave harbour—let alone reach its air-launching area some 18 hours or more away—its own shore-based bombers squadrons, if it had them, could take off and strike at an objective 600 miles away. Even if the fleet were patrolling at sea, it can be seen that its aircraft are seriously handicapped by the speed of the ships, unless they happen to be fortuitously on the spot—and that suggests the clue to the carrier's true role.

Atomic war might well be very short; if there is no adequate defence at hand there will be no time to call up slow-moving re-inforcements from hundreds of miles away. Really vital spots are unlikely to be numerous; even so, will the Navy, so far as its commitments are concerned, be able to guard them all adequately with carrier forces? Past experience suggests that the answer is no. In this kind of war sea forces will be able to take on only those targets which happen their way; others will need to be dealt with by shore-based aircraft. Fleet Admiral Chester Nimitz, U.S.N., laid down the doctrine* that, where a large water mass lies athwart a potential enemy's path, the carrier force should be used as an outer radar and defensive screen against strategic bombers. This offers the Royal Air Force, in prosecuting its primary role, a method of filling an awkward gap. But it seems improbable that prior reconnaissance would not have warned the enemy of the fleet's exact whereabouts. Nevertheless, it is considered that to increase the size of carriers merely to carry larger (atom) bombers, as also advocated, is unsound, and is likely to be ineffective for reasons already given.

Land-based bombers, navigated by much improved radar aids, can now bomb by day or night through cloud with far greater accuracy than in the past. The last superiority of the ship-borne aircraft in attacking shore targets is therefore lost (for they naturally cannot carry the radar equipment of the larger aircraft). But of course bombers need bases, and it is the number, size and cost of these that is a popular argument in favour of using carrier forces instead in some strategic and tactical roles that are not strictly naval. The economic difficulties are over-rated. A carrier task force is by no means an inexpensive item (one carrier alone is the equivalent of a good-sized airbase), and they too need harbours with docks and dockyard facilities; while the docking of super-carriers must be presenting a problem in itself. Land bases may be overrun by the enemy but, with the tremendous range of large aircraft to-day, there seems no need for the advance bases to be either large or elaborate, for only the medium-range bombers and the fighters may need them. The work of the American "Sea-bees" during the war showed how quickly runways could be prepared. The fall of Malaya lost us the air bases there; it also lost us Singapore. And the next line of airfields was no further back than the next line of naval bases from which the fleet was forced to work. The strategic disposition of balanced land, sea and air forces round the world shows signs of becoming a permanent necessity. But there is no reason why advanced airfields should prove any more vulnerable and expensive than the alternative of using carrier forces; on the contrary. The Navy should have more than enough to do, if the past is any guide, guarding the many thousands of miles of sea lanes involved without being lured into commitments outside its proper sphere.

* The Nimitz Report, "Brassey's Annual," 1948, p. 537.

THE NAVAL TASK

The chances that another world war would not include the use of the major weapon, the atomic missile, are small indeed; but they cannot be entirely discounted, and attritional warfare may, if only for a time, recur. In any case, the armed forces will always be needed for police duty, even major police action as in Korea. Yet the first important development mentioned, the increased range and speed of aircraft, remains. And this, as stated, leaves the carrier at a disadvantage, in that she can be effective only against "targets of premeditation." These include: convoy escort, close anti-submarine patrol, defence of the fleet, offensive action against surface forces immediately in reach, amphibious operations. For all these, carrier aircraft are specifically designed, and the fighters are as efficient as ingenuity can hope to make them in the event of action against their land-based opponents. For offence and defence in other purely naval commitments which are not under the fleet's protective umbrella, it is considered essential for the Navy to have its own land-based component. These commitments would be: extended anti-submarine patrol, strikes against surface raiders or forces beyond the immediate range of the fleet, naval reconnaissance.

But whatever the weapon, the manner of its employment must conform to the principles of war governing the Service using it. Yet, as has been said, this is not always remembered. On the night of the 25-26 October, 1944, during the Battle of Leyte Gulf, a Japanese squadron penetrated the Surigao Straits and came within a short measure of disrupting if not wrecking a major campaign. Thousands of American soldiers were being landed in that part of the Philippines; also concentrated there were tankers carrying nearly all the fuel for the Central and South Pacific areas. Aircraft were unable to operate against the enemy ships that night, and it was the battleship force which eventually routed them. But how did the Japanese come so near to jeopardising such a vital operation? Various excuses can, and have been, offered; yet surely it amounts to this. Our Allies had on that occasion forgotten or neglected the primary object of naval power: to achieve command of the sea first, by securing its own communications while denying the enemy his. And the Americans had the forces to do this. Urgent and necessary as are many of the diverse requirements of combined operation in modern war, danger lies in the temptation to think them of paramount importance.

The Navy's cardinal function is founded upon a principle of war that has not been affected by the evolution of weapons. Side-shows which distract from concentration on the prime objective invite defeat if not disaster. Similarly, the efficient prosecution of the grand strategic aim of the country is possible only if all three armed Services are in true mutual support—in will, technique and equipment. To achieve that, balance is all.

G. W. R. NICHOLL

CHAPTER XI

NAVAL EXERCISES OF 1951

ORIGINS

SOON after the war it became obvious that if peace at sea was to endure the "free" nations of Western Europe would have to pool their naval resources. What was visualised was, in effect, an international force to police the waters of Europe, strong enough in itself to beat any other force out to make trouble. How such a many-navied fleet could be brought into being presented a naval problem of the first magnitude. The aim was clear enough: it was that all the subscribing navies could be trained to function smoothly as one fleet under the orders of a commander-in-chief chosen from any one of them. Such a venture in combined action at sea, though eminently desirable, had never yet been tried in time of peace.

There were naval experts who said that an "international" fleet was a mere pipe-dream. They drew attention to language barriers, to difficulties in the way of getting a unified system of communications, to the lack of a common conception of strategy. Even if Europe's navies got together they would be and remain an imposing assembly of ships rather than efficient parts of a combined fleet. As the navies did not think and talk alike, how could they be expected to work together?

Events of the past three or four years have done much to remove such fears. In 1949 the navies of Britain, France, the Netherlands, and Belgium, the member countries of the then newly formed Western Union, met to take out a long-term policy of mutual insurance. They were well aware of all the obstacles to true and effective co-operation at sea, of the need for a spirit of give-and-take, and of the years of unremitting practice which would have to be put in before the individual fleets could combine really well. For such a venture Britain was the natural leader: by 1949 the Royal Navy had passed through the depressing period which immediately followed the war and was once more ready for its peacetime tasks. After the difficult time of transition and "run-down" it was again an efficient fighting force, if a small one by earlier standards.

"Operation Verity" in the summer of that year marked a turning-point in naval history. Directed by Admiral Sir Rhoderick McGrigor (now First Sea Lord), who then commanded the Home Fleet, warships of the four navies gathered off the Cornish coast, the rendezvous being Mount's Bay. As might be expected of this first effort at naval co-operation on a large scale, "Verity" was a set piece, a simple exercise planned chiefly to get the performers to show their paces—and reveal their misunderstandings—under the keen eye of a very senior officer immensely experienced in the business of "grooming" naval forces to work together.

It was a memorable occasion. There were 109 warships present, 70 of them British. The assembled ships first spent three days at anchor doing harbour drills, which largely consisted of inter-fleet day and night

signalling and the testing of communications generally. Later Admiral McGrigor took the ships to sea and in the English Channel and the Bay of Biscay put them through easy tactical exercises, these ending with a convoy being led through a dummy minefield off Portland Bill by mine-sweepers of the four navies.

Many lessons were learned, for, in this meeting of fleets with very limited experience of peacetime co-operation, mistakes were sought and found. At sea technical equipment in some of the ships proved unreliable and differences of procedure caused trouble. Sometimes station-keeping was below standard, though not because of inefficiency. At one stage night manoeuvres had to be abandoned when it was found that orders were being interpreted differently by various ships and a convoy and its escort could not safely keep in formation.

Nevertheless, this initial stocktaking, for such it was, augured well for the future. Admiral McGrigor, reviewing "Verity" later at a conference on board his flagship, H.M.S. Implacable, said he was much impressed by the good will shown among the navies and by the way they had worked together. He added: "Now we can go forward in great confidence: before we had only great hopes."

So the foundation was laid. All the combined naval exercises since held in European waters, both those of Western Union and, latterly, its larger successor the North Atlantic Treaty Organisation, have followed the "Verity" pattern. Now that naval co-operation is a working proposition, even if the participating navies have still far to go, the exercises may be more advanced, but the purpose behind them has not altered. It is the protection of convoys, fleets, and individual ships against under-water, surface, and air attack, especially against assault by the fast submarine and the mine.

THE POST-WAR MINE CLEARANCE OPERATION ENDS

It is fortunate that since the war most if not all of the maritime nations of Western Europe have had practical experience of mine-sweeping technique, even if it was, in a sense, compulsory; for in any future war at sea such work will be of first importance. In 1945 all the maritime nations found that they had been left a grim legacy which called urgently for attention: without delay a start had to be made with the colossal task of clearing the waters of Europe of remaining mines so that trading ships could again pass on their lawful occasions in reasonable safety. Europe's seas were still fouled by great numbers of the mines which belligerents had been laying since 1939: it was estimated that 22,300 of these deadly weapons had been sown in Britain's coastal waters and elsewhere in North-West Europe. If maritime trade was to be restarted on the pre-war scale something had to be done, and at once.

Then followed six years of co-operation on the grand scale. Necessity was the spur, and if only in its own interest every maritime country was anxious to contribute to the common effort. The biggest mine-sweeping operation on record was launched in 1945 and continued until the end of 1951. It was a magnificent example of comprehensive planning and, incidentally, sound proof of what can be done when nations pull together for the common good.

First there was formed an International Mine Clearance Board, its chairman being British—the Director of Operations at the Admiralty—and its members representatives of Great Britain, the United States, France, and the U.S.S.R. The Board was charged with controlling and co-ordinating the efforts of mine-sweepers provided by fifteen nations, among which were Poland, Yugoslavia, and the last-war neutrals, Sweden and Turkey.

The operation involved the sweeping of many large areas. One hundred thousand square miles awaited attention in the North Sea alone. Some areas in which ground mines with delayed firing mechanisms had been laid required to be swept several times. Stretches of sea had to be dealt with methodically, like the pieces of a vast jigsaw puzzle, slowly and painstakingly by groups of ships moving at an effective sweeping speed of about nine knots. As the operation progressed no fewer than 2,000 mine-sweepers from all the contributing nations were engaged in the work. Russian ships cleared the Baltic, Barents and Black Seas, and until towards the end of the operation faithfully reported results of their work to the Mine Clearance Board.

With the end of the planned mine clearance and the winding up of the Board and its organisation, the seas of Europe having been cleansed as far as is humanly possible, certain of the interested countries are continuing to sweep their own coastal waters independently. Local work is still going on in the areas formerly most heavily mined and where for some years to come buoyed channels must be retained for the use of shipping. Such areas exist off the Dutch coast, in the approaches to the Baltic, and in parts of the *Ægean*. Some of the navies now belonging to N.A.T.O. are therefore in constant practice and thus can bring to the combined exercises first-hand experience of the work. As a newcomer to the Organisation, Greece, for instance, should be able readily to take her full share in combined mine-sweeping manœuvres; since the war her ships have often co-operated with those of the British Mediterranean Fleet in clearing dangerous patches off her coasts.

Much attention has been given to this type of work in the more recent exercises, mine-sweeping training having a high rate of priority in the sea programmes of N.A.T.O., the Home and Mediterranean Fleets, and the individual foreign navies. In the last year or two the public of Great Britain and the United States have had many official warnings that in any future war at sea the Allies could expect attacks with fast submarine and mines to be launched on a massive scale. The mine, a weapon which is unselective, has long appealed to the Russian military mind. Hence the thought the Western Powers are giving to that part of their naval programmes which concerns the building, refitting and equipping of mine-sweepers, and the training of crews for them. Hence also the increased time given to mine-sweeping practices in the more recent exercises and the added emphasis on this aspect of naval activities of 1952. Mine-sweeping manœuvres were the outstanding feature of the 1951 programme; in 1952 not only are more of these exercises to be held for combined fleets, but for the first time a series of practices has been arranged in Britain's home waters specially for officers and men of the Royal Naval Volunteer Reserve.

PROGRESSIVE EXERCISES

The major exercises which have taken place since the formation of Western Union—"Verity" (1949), "Activity" (1950), and "Progress" (1951)—may be regarded as signposts on the hard road of N.A.T.O. naval co-operation, each of them recording some slight advance towards the ideal of the large and highly efficient combined fleet.

Unlike its predecessor, "Activity" did not keep rigidly to a schedule worked out in great detail beforehand, and it was much more than a mustering and assessment of available forces. Within the broad limits of the 1950 plan the commander-in-chief, this time Vice-Admiral Willinge of the Royal Netherlands Navy, was able to use his discretion in dealing with situations as they arose. It was a noticeable step forward.

"Progress", which in 1951 followed the usual pattern, was smaller than either of the earlier ones and incorporated the lessons learned from both. The commander-in-chief was Vice-Admiral Pothuau, of the French Navy. Early in June he took charge of 48 ships of the French, Dutch, Danish, and British navies, which met in Douarnenez Bay, Brittany, and went to sea for a week under his orders. Among the ships were a carrier, four cruisers, 23 destroyers and frigates, and 13 submarines, the entire fleet receiving support from a large section of the 100-strong force of British and French aircraft joining in the exercise. Out in the Bay of Biscay ships and planes fought running "battles" against submarines, surface raiders, and massed aircraft. It was the mixture as before and the result showed that the medicine was doing good. In effect, this exercise marked the end of the first phase of Assembly and the beginning of the second of Consolidation—the follow-up period of slow but certain progress achieved by steady practice.

Directing forces participating were: British, Vice-Admiral C. A. L. Mansergh, Flag Officer, Second Cruiser Squadron; Netherlands, Rear-Admiral A. de Booy; Norwegian, Captain A. A. Sorensen; and Danish, Commander J. Peterson. Among the observers was Admiral Sir Philip Vian, C.-in-C., Home Fleet, who watched the proceedings from H.M.S. Indomitable. After the exercise the whole force put into Cherbourg for a few days to give officers and men of the different ships an opportunity to meet and discuss the week's happenings.

OTHER MAJOR EXERCISES

Altogether more than twenty large and small naval exercises were held under N.A.T.O. last year in the waters of North-West Europe and the Mediterranean, in addition to which there were the manoeuvres arranged by the Home and Mediterranean Fleets, the Royal Marines, and the Reserves. In the N.A.T.O. programme ships were drawn from eight navies, those of Britain, the United States, France, the Netherlands, Denmark, Belgium, and Italy. It was the biggest of the annual programmes to date, beginning in February with a meeting of British and Danish light forces off the East Coast and British-American manoeuvres in the Mediterranean, and ending in the autumn with a British-Danish-Norwegian exercise and a British-French exercise in the same respective areas.



Warships of Four Navies after Joint Exercises. N.A.T.O. Navies at Naples, February 1952

Little was published at the time about the first big practice in the Mediterranean. This was held on February 11 and 12 by an unspecified number of ships of Britain's Mediterranean Fleet (C.-in-C. Admiral Sir John Edelsten), Britain's Home Fleet (Admiral Sir Philip Vian), then in the Mediterranean on its spring cruise, and the United States 6th Fleet (Vice-Admiral John J. Ballentine, U.S.N.). The overall direction was the responsibility of Admiral Robert B. Carney, C.-in-C. of United States naval forces in the Eastern Atlantic and Mediterranean, and who flew his flag in the American heavy cruiser U.S.S. Columbus. In these manœuvres carrier-borne aircraft played a big part, especially during the first day. Admiral Carney, by the way, had not at that time received his second "hat." His additional appointment under N.A.T.O. as Commander-in-Chief of all the Allied forces in southern Europe, making him the opposite number of Admiral Sir Patrick Brind in Northern Europe, did not materialise until about four months later.

APRIL

Towards the end of April ships of the Home Fleet, setting out on their summer cruise, exercised at sea while on passage to Invergordon. The whole fleet, which included the carriers Indomitable, Indefatigable, and Vengeance and the battleship Vanguard, later went to the Irish Sea, some of the ships joining in the annual "Summer War" there.

Other of the more important events of 1951, listed in chronological order, were:

MAY

"RUN AGROUND 11"

The demonstration, an amphibious exercise by members of the three Services, took place on May 9, 10, and 11 at the R.M. Barracks at Eastney and at Culver Cliff, near Sandown; it was arranged for officers studying at the Staff Colleges, but other officers also witnessed it. After the main display of a landing on the beaches at Eastney, spectators crossed to the Isle of Wight to watch Royal Marine Commandos demonstrate the latest technique of cliff assault. The exercise at Eastney was preceded by an exhibition of equipment used in amphibious warfare. The beach landing itself was in three phases: (1) the preliminary reconnaissance operations; (2) the "softening-up" process and assault landing on a defended beach; and (3) the subsequent period of build-up. For the purpose of the demonstration the whole operation was compressed into just over two hours. In time of war, of course, reconnaissance work might be spread over many weeks.

An initial survey by a midget submarine, which came inshore and surfaced near the water's edge, the clearance of submerged obstructions by frogmen, the landing of a raiding party from a small boat to capture a "defending" sentry and gather information of defences, a naval bombardment—represented by puffs of smoke from the ships and from explosive charges buried in the shingle—and attacks by waves of low-flying aircraft coming in from the sea were in the sequence of events before the landing. The assault itself, directed from H.M.S. Meon, a "Landing Ship Headquarters," was carried out by some 600 men of the three Services. The

"invading" forces with their tanks and other equipment were taken to the beaches by the tank landing ship *Sulva* and a variety of landing craft, many from the Royal Marine Amphibious School.

Among the spectators on the three days were senior officers of the Royal Navy, Army, and R.A.F. and some foreign military students attending the Staff Colleges. Army units taking part included D Troop, K Battery of the 5th Regiment, R.H.A.; an amphibious squadron of No. 7 Royal Tank Regt.; No. 30 Battery of No. 16 Light Anti-Aircraft Regt., R.A.; No. 32 Assault Regt., Royal Engineers, the 1st Battalion of the Bedfordshire and Hertfordshire Regt.; the Wading Trials Branch, M.T.D.E.; Royal Electrical and Mechanical Engineers from Instow (Devon); and men of the Army M.T. School at Bordon (Hants).

"RED DAGGER"

A weekend was chosen for this event, the first invasion exercise organised by the permanent Volunteer Reserves. It was held early on the morning of Sunday, May 27, and took the form of a landing some four miles east of Lulworth Cove by London Reservists and London Territorials. The Task Force, which was supported and opposed by R.N.V.R. Air Squadrons, consisted of 22 landing ships and craft carrying about 1,000 men, nearly all of them members of the R.N.V.R., R.M.F.V.R., and the 56th (London) Armoured Division, Territorial Army. Manned largely from the Naval and Marine Reserves, the force sailed from Portsmouth on the Friday evening, after embarking troops and military equipment and a R.M.F.V.R. Commando troop, and early on Sunday morning took up positions for a dawn landing. The troops stormed the beaches under cover of a naval "bombardment" (represented by the presence of the destroyer *Finisterre*).

The aim of the exercise was to establish a beach-head in Worborrow Bay, link up with an infantry division assumed to have been cut off by a strong opposing force, and then to deny the "enemy" use of his lines of communication and ports. Four R.N.V.R. air squadrons took part: No. 1831 Squadron, based at Stretton, Warrington, Lancs; No. 1832 Squadron (Culham, near Abingdon, Berks); No. 1833 Squadron (Bramcote, near Nuneaton, Warwicks); and No. 1840 Squadron (then based at Culham and now at Ford, Sussex).

JUNE

"FACTOTUM"

Sixty ships from the navies of Britain, France, the Netherlands, Belgium, and Norway assembled at Ymuiden and Scheveningen in June, and for ten days carried out in Dutch waters the biggest mine-sweeping exercise of the year. "Factotum" was directed by Rear-Admiral C. W. Slot, Commander-in-Chief, Netherlands Home Station. As has been usual in recent events of this kind, the ships swept for exercise mines. When detonated such mines emit smoke, thus giving a spectacular touch to these monotonous practices. Later the ships were reviewed off Scheveningen, Prince Bernhard of the Netherlands piloting his own plane over the fleet.

Three other mine-sweeping exercises were held during the month, one in Scottish waters and two in the Mediterranean. The first was of much interest to naval reservists, being carried out by the new 101st Mine-sweeping Flotilla, the first to be formed since the war with ships manned entirely by members of the R.N.V.R. Consisting of units from four Divisions: the Thames (London), Humber (Humber Division), H.M. M.M.S. 1089 (Forth) and Bernicia (Tyne)—it began its career by going to Kirkcaldy Bay for a few days to sweep exercise mines laid by the destroyer *Opportune*.

The other meetings in the Mediterranean were smaller than "Factotum" but were planned on similar lines. They were attended by combined forces of British, American, and Italian ships, each exercise being conducted by an Italian senior naval officer. The first of the two took ten days, and the second, which was in the same area, occupied one week. During the latter 22 ships (10 British, 10 Italian, and two American) worked at clearing three dummy minefields and sweeping channels on routes to various Sicilian ports. At the conference afterwards held at Malta results of the practices were analysed, and it was then established that a large number of the mines laid had been swept. Commenting on the success of the exercise, the Admiralty said that relations between the three navies were most harmonious and the command set-up was simple and clearly defined.

CONVOY PROTECTION

A convoy exercise lasting 48 hours and conducted by an Allied staff under Admiral Sir Arthur Power, Commander-in-Chief, Portsmouth, took place towards the end of the month in the English Channel and the southern part of the North Sea. It involved 85 ships and 15 squadrons of aircraft from the forces of five N.A.T.O. nations. The convoy was a mixed one, including the British cruisers *Cumberland* and *Jamaica*, all its ships merely serving as "targets" and taking no active part in the exercise. Among ships actively engaged were units of the Mine-sweeping and Fishery Protection flotillas, destroyers, frigates, and submarines. The convoy was repeatedly attacked by sea and air, the air strikes being made by British naval planes, and planes of the Belgian, Dutch, and United States Air Forces. Stoutly defending the convoy were ships of the five navies, naval planes, shore-based aircraft of R.A.F. Fighter and Coastal Commands, and of the Belgian and Dutch Air Forces.

THE "SUMMER WAR"

Planned by Rear-Admiral S. M. Raw, Flag Officer (Submarines), this exercise was larger than any of its predecessors, but followed the pattern of "Summer Wars" held annually in the Irish Sea since 1946. A series of submarine attacks was made on escorted convoys and merchant shipping in the area, and the "enemy" were engaged by anti-submarine units of the Home Fleet and the training squadrons and by naval and R.A.F. aircraft. Some of the 18 submarines engaged joined the "war" from a N.A.T.O. exercise, among them being the Dutch ships *Zeehond* and *Tijgerhaai*. Also present were the carrier *Vengeance* and cruiser *Sheffield*,

the submarine depot ships Maidstone and Montclare, and 30 anti-submarine vessels.

AUGUST

THE "DEFENCE OF MALTA"

Several manœuvres, most of them on a small scale, took place in the Mediterranean during August for ships and aircraft of Britain, the United States, France, and Italy. The most noteworthy was the "Defence of Malta" exercise, which included commando raids on the island's beaches.

Admiral Edelsten, who conducted it and also directed the defending forces, was able to call upon the Malta Garrison, the resources of the R.A.F. Malta (A.O.C., Air Vice-Marshal N. H. D'Aeth), and also to get help from French patrol craft and naval and army air squadrons in Tunisia and from Italian coastal forces and aircraft based in Sicily. Besides having at his disposal aircraft from both sides of the Mediterranean, Admiral Edelsten for some of the time was aided by aircraft of R.A.F. Bomber Command; these were flown out for the exercise and in the course of it played both attacking and defending roles. French forces were commanded by Vice-Admiral P. E. M. J. Barjot, Italian forces by Rear-Admiral E. Mimbelli, and those ashore by Major-General G. W. E. Heath, General Officer Commanding Troops, Malta Garrison.

Opposing were the forces of Vice-Admiral Gardiner, U.S.N., commander of the United States 6th Fleet, and who was flying his flag in the heavy cruiser Salem. These forces were from his own fleet and included a heavy cruiser task force, an amphibious task force, a convoy and several submarines. His task was to get the convoy through the defended Sicilian Narrows and neutralise Malta and other "enemy" strongholds.

In the battle, honours were about even. Flying from points outside the effective range of Malta's local and extended air defences, planes from Admiral Gardiner's carriers on the first day made several attacks on the island and claimed to have damaged shore installations, aircraft on the ground, and the cruiser Gambia in Grand Harbour. His pilots also reported that they had surprised some submarines which were being escorted through a minefield and had punished them heavily. Later the British task force joined in and the convoy turned back. On the third day the "invaders" struck again, their commandos raiding Malta's south and east coasts and reaching two of their objectives. A main landing followed, after which the amphibious forces withdrew. The Admiralty described this as "a very satisfactory exercise packed with incident," saying that the aims of giving tactical training to all units engaged and of testing Allied co-operation were amply achieved.

SEPTEMBER

THE AUTUMN PROGRAMME IN THE MEDITERRANEAN

After the Malta exercise Admiral Edelsten, flying his flag in the cruiser Liverpool, took 32 of his ships on a three-months' cruise in the Eastern Mediterranean. The fleet joined in a number of N.A.T.O. practices and carried out a training programme of its own before returning to its base.

In September a cruiser and several destroyers visited Athens and for

ten days exercised with ships of the Royal Hellenic Navy in Greek waters, the programme being arranged by the Greek naval commander-in-chief and the British Second-in-Command, Mediterranean Fleet. While these manœuvres were going on, other British ships, including frigates and submarines, practised with Italian units. These, too, were mainly anti-submarine exercises, and were planned by the Italian Commander-in-Chief and conducted at sea by the Admiral commanding the First Division Italian Fleet and by the Flag Officer (Destroyers), Mediterranean.

The latter officer also commanded the British Naval force when the season's last exercise was held by H.M. and French ships off the south of France in October.

It may be, perhaps, too much to hope that the different navies of N.A.T.O. will attain the degree of understanding needed for almost instinctive co-operation at sea. At any rate they are on the right course.

NOWELL HALL.

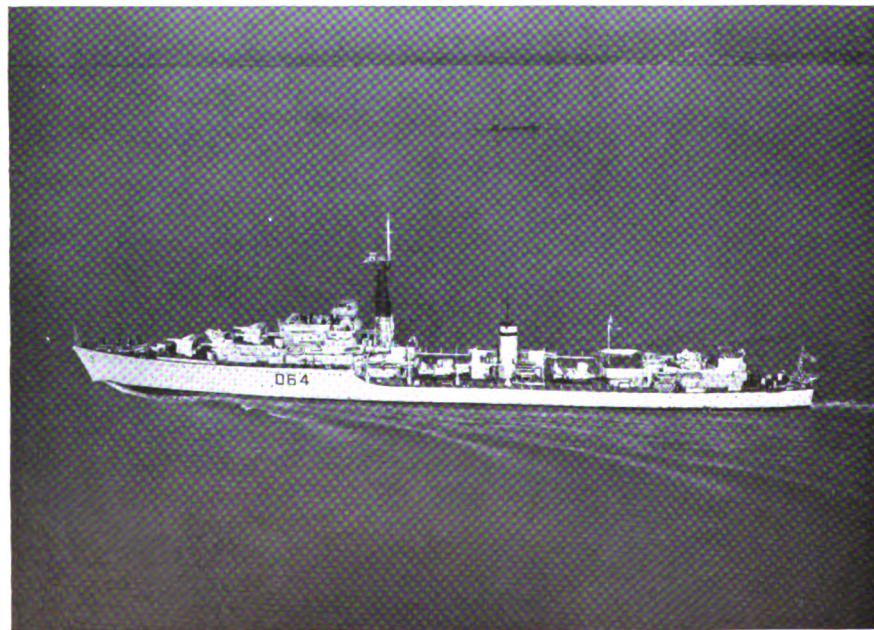
CHAPTER XII

FOREIGN NAVIES

A SENSE of caution still governs the building programme of most of the more important naval powers, and the majority of them show a natural and understandable reluctance to commit themselves to a concrete programme in view of the many new weapons which are still in the course of evolution. In this respect, the major powers, with one exception, are in the fortunate position of having large reserves on which to fall back. The ships laid up may be old, in the modern conception of that word, but at least they are in being, and to bring them to operational readiness is a relatively minor undertaking. A subsidiary factor in this present period of caution is the wildly mounting cost of new construction. Only the very wealthiest of countries can now face the cost of new building so far as large ships are concerned, and only in very few countries are the building yards busy on these types of vessels.

The exception, of course, is Russia, who finished the 1914-18 war with few, if any, naval reserves. Her emergence as a naval power of the first rank dates from 1946, when she was able to absorb a fairly large proportion of the German Fleet captured when her armies overran the Baltic ports. Since then a greatly accelerated building programme has enabled her to bring together a formidable collection of ships, perhaps a little unbalanced in composition according to the more orthodox views of sea power, but one which undoubtedly exerts a powerful influence on the other navies of the world. There have, however, been some indications, in various Press reports, that all is not well in Soviet naval expansion and that, particularly as regards submarines, new construction is lacking in those technical aids to attack and defence which are now standard fittings in the submarines of other navies. The recent conviction in Sweden of a naval engineer on charges of spying for the Soviet Union gave, in the limited evidence made public, some confirmation of this view. But it remains as difficult as ever to penetrate the extreme secrecy which shrouds all new naval development, and it would be folly to underrate the technical genius of Soviet scientists or the "acquired" genius of those German technicians who fell into the hands of the Russians in the great advance through Germany in 1945. Certain it is that the planned increase in submarine strength has not been achieved, and it is more than probable that the reason is as much a reluctance to build in advance of technical design as from overrating the capacity of Soviet shipyards.

During the past year considerable progress has been made in the various research projects being carried out on new naval weapons. The United States has, naturally enough, been the leader among the foreign countries in this research, with her chief energies devoted under four main heads. These are "the true submersible," for which an atomic power plant has been designed and is under construction; the guided missile, of which further tests have given both increased range and accuracy; the atomic bomb, in which, after a long series of tests in Nevada, United States



Above. Anti-submarine Frigate, converted from Destroyer. H.M.S. Rocket
Below. British Destroyer. H.M.S. Scorpion

(Official photographs by permission of the Admiralty)

scientists are reported to have perfected a weapon capable of tactical use; and electronics, where further development has produced a considerably more sensitive search radar for anti-submarine work. A claim by the Argentine Government to have made a hydrogen bomb has not, as yet, been substantiated, and little is known of any Russian developments in atomic research, in spite of some optimistic claims put forward by Soviet delegates during the year at various international conferences. Most of these were thought to be propaganda. It has been reported that considerable progress has been made in France with a new naval dual-purpose gun, but details are lacking.

There is little to report concerning the smaller navies of the world, which have in the main contented themselves with very modest building programmes. A few, whose geographical position makes them important units in the democratic defensive line-up, have benefited from the generosity of American aid programmes; in others, a burst of activity under the impetus of a worsening international outlook has resulted in the completion of vessels which had been over-long on the stocks. A few new orders have been placed, but in the main it is only in the United States and in Russia that any notable new building has been in progress.

UNITED STATES

The 1951-52 naval appropriations reached the record total of \$15,079,939,225, a rise of some \$11,500,000,000 in three years. This was to sustain an active fleet of 1,161 ships with a total of 705,000 officers and men, increasing to 800,000 by mid-1952. At the time of writing, fully comparable figures for 1952-53 are not available, although the total defence budget of \$56,062,405,890 is considerably larger than that of the previous year. The strength of the Navy is to be raised to 805,000 officers and enlisted men, with a Marine Corps of 175,516. The Navy's share of this immense total is reported to be \$15,552,000,000, but a considerable portion of the remainder will be devoted to research projects in which the Navy will share. While the budget statement mentions 237,000 tons of new fighting ships to be built during 1952-53, it does not particularise in any detail, and the ultimate division of this tonnage as between classes of vessels is as yet obscure. One report mentions 2 aircraft carriers—one up to 60,000 tons—4 destroyers, 4 submarines, 30 minesweepers, 3 destroyer escorts, and auxiliary ships, but on the face of it this seems to be too nearly a repetition of the 1951-52 programme to be absolutely convincing, although it is unlikely to be very far from the fact.

The United States Navy has received a surprising recruit for its expansionist programme in the person of Mr. Herbert Hoover, the former President of the United States. For long an apostle of isolationism, Mr. Hoover has stated, "on the record," that America should build highly mobile sea forces for the defence of Western Europe. Mr. Hoover's influence in American political life is still large enough to command an attentive hearing, and his advocacy of a big Navy should make easier the passage of naval demands through a critical Congress.

The office of Chief of Naval Operations, which was still vacant at the time of writing these notes last year, because of the sudden death of Admiral Forrest Sherman, was filled by Admiral William M. Fechteler. He was relieved as Commander-in-Chief Atlantic Fleet by Admiral Lynde D.

McCormick, who in turn was selected as Supreme Commander North Atlantic by the N.A.T.O. powers. Admiral W. B. Radford remains as Commander-in-Chief Pacific, with Vice-Admiral C. T. Joy holding the Far East Command. Admiral R. B. Carney, Commander-in-Chief Eastern Atlantic and Mediterranean, was selected in June, 1951, as Commander-in-Chief Allied Forces Southern Europe, under General Eisenhower, but retains operational control of the United States Sixth Fleet in the area. The new commander of the United States Naval Forces Eastern Atlantic is Vice-Admiral Jerauld Wright, who also becomes deputy Commander-in-Chief of the United States Naval Forces Eastern Atlantic and Mediterranean. The retirement of General Marshall from the office of Secretary of Defence, because of ill-health, was universally regretted, as under his able and methodical direction the building up of armed strength was proceeding smoothly. He has been succeeded by Mr. Robert A. Lovett. Similarly, Mr. Francis Matthews has resigned during the year under review from the position of Secretary of the Navy, the new Secretary being Mr. Dan A. Kimball.

Work has continued during the past year on the building and equipment of naval bases throughout the world required to service the ever-growing fleets. Port Lyautey, in French Morocco, is progressing fast as a base in the Mediterranean area, and there have been several reports of the proposed acquisition of new naval bases in Spain both on the Mediterranean and Atlantic coasts. The Aleutian base takes on a new importance with the announcement that a rich oilfield, with an estimated capacity of 150 million barrels, has been discovered at Umiat, in Alaska. The re-opened base at Midway is now fully operational, as also is the leased base at Trinidad, British West Indies. There have been some reports of other bases in the Pacific, especially in Far Eastern waters, being acquired.

Although it has been a major commitment of the United States Navy to bring forward an increasing volume of ships from the "mothball fleet" throughout the year, this has not been permitted to interfere with the programme of operational research, which has continued in full force. It is reported that considerable progress has been made with the nuclear reactor under construction with the Westinghouse Electric Corporation and that the project is proceeding smoothly. The trials have, it is reported, been taking place at the Argonne National Laboratory, near Chicago. This, it will be remembered, is for submarine propulsion, the boat's hull being constructed at Groton, Connecticut, by the Electric Boat Company. A great many reports have been current during the year that this prototype submarine will shortly be operational, but these can be dismissed as wishful thinking. Her construction must obviously be a long-term project, and even after her completion there will have to be a considerable period of trials. In this connection a report has also been circulated that the preliminary work is being begun for nuclear propulsive machinery for a new large aircraft-carrier. This again must be accepted with caution, for although a perfectly feasible proposition, it would naturally be expected that the authorities would await the result of the submarine trials before launching out on a large scale into this new and still largely undeveloped avenue of marine propulsion.

Research is still proceeding on the closed-cycle hydrogen-peroxide engine, and it can be inferred that considerable progress has been made by

the reported construction of a \$60,000 storage tank for highly concentrated peroxide at New London, Connecticut. The boat herself is under construction at the Portsmouth Navy Yard. One report states that the new engine has been satisfactorily tested at New London, but this may again be an instance of that over-optimism to which so many public men in the United States seem prone.

In the meantime, while awaiting the final appearance of these new fast submarine developments, the "guppy" programme has been again accelerated, with two-thirds of the 'Tench-Corsair' class and one-third of the 'Balao' class already completed. Others are to be taken in hand during the present fiscal year. It has been stated that guppy conversion raises the submerged speed from an average of 10 knots to slightly over 17 knots, but the endurance at this speed is unlikely to be very great. The six 'Attack' submarines of the 'Tang' class, which were previously reported to be powered with hydrogen-peroxide engines, are now being fitted with a new design of diesel engine.

Co-existent with the research into new forms of submarine warfare is the research into anti-submarine methods. The tried and well-tested methods of the 1939-45 war have been further refined and developed, and considerable thought and experiment is being devoted to new forms of anti-submarine warfare. Radar research is still considered to be the most profitable field, and a new long-range, high-endurance type of the Neptune Navy bomber has been evolved for anti-submarine search, fitted with the new search receiver which can distinguish between wave returns and the top of a Schnorkel tube. Ship radar has also been developed for more sensitive work. The use of Sonobuoys has been further developed, as also has the design of new weapons of the depth-charge type.

Among the newer types of anti-submarine weapons under development are small submarines, of which four have been laid down. These, it has been stated, will embody many new search devices for under-water detection, and also forms of target-seeking torpedoes. Like other major navies, the United States is building special anti-submarine vessels, though some, described as destroyers, appear to be more nearly the size of what used to be light cruisers. Airships and long-range patrol planes are also being used for this purpose, and research is being carried out to see whether helicopters can be adapted to carry a full set of anti-submarine instruments and weapons. One newspaper reported that five small carriers were to be built to be devoted entirely to anti-submarine warfare, but there has been no indication in the published building programmes that such a step is contemplated.

The whole problem of anti-submarine warfare has been the subject of a certain amount of hysteria in the United States. A Canadian report of Soviet submarines off the east coast—one supposedly sighted in the Gulf of St. Lawrence, a second in the Bay of Fundy—was widely circulated throughout America and gave rise to considerable public speaking, much of it extremely ill-informed. The United States Navy, most commendably, refused to be hustled by the popular clamour, and although the Russian bogey has been raised on several occasions it has not been allowed to influence the steady, systematic research and development programmes.

In the field of guided missiles official reticence makes it impossible to record with any accuracy the year's developments. The "re-activation"

programme calls for two more heavy cruisers to be taken from Reserve and converted into guided missile ships in addition to the conversions already under way. A new height record for rockets was claimed by the Department of the Navy on August 7, 1951, when a Viking rocket rose to a height of 135 miles in a test at the White Sands proving ground in New Mexico. The rocket stayed in the air for 10 minutes and at its peak reached an estimated speed of 4,100 miles an hour.

An announcement by the Chief of Naval Operations gave it as his opinion that the guided missile would become the basic naval weapon of the future. He said that they have been launched regularly from both surface vessels and submarines during the last two or three years, and that they could be directed on to their final target by submarines stationed at intervals along the route of their flight. An automatic communications unit has been developed by the United States Navy for the control of these missiles, capable of transmitting 60 messages simultaneously from a supersonic guided missile in flight. These messages would give the required data for control from the ground.

The year under review has seen unusual activity in the testing of atomic weapons, the majority of them in Nevada. It has been stated that tests have proved the possibility of following up an atomic explosion much more quickly than had been anticipated, and that suitably designed clothing could give a high degree of protection from burning and the other detrimental effects of radioactive emanations. Other results from the Nevada tests have given rise to repeated claims—and in the highest quarters—that "fantastic new weapons" have been evolved. What these may be is anyone's guess, but the statement has been widely presumed to refer to tactical weapons.

The total strength of the United States Navy is 15 battleships, 36 fleet carriers, 66 escort carriers, 2 battle-cruisers, 25 heavy cruisers, 42 light cruisers, 348 destroyers, 263 frigates and escort destroyers, 194 submarines, 214 minelayers and minesweepers, and 168 patrol vessels. Auxiliaries total 1,000 amphibious craft, 553 fleet auxiliaries, 2,000 service vessels, and 74 dry docks. As at June 30, 1952, the active fleet was planned to be 3 battleships, 17 fleet carriers, 10 escort carriers, 19 cruisers, 250 destroyers and frigates, 100 submarines, and 880 auxiliary craft. By the end of 1952 one more battleship, two more fleet carriers, 90 more destroyers, and 120 more auxiliaries were to be added to the active fleet.

A considerable programme of fleet manœuvres and exercises, both individually and in co-operation with other navies, has been carried out during the year under review. These have included large-scale exercises in the Mediterranean in conjunction with British, French, Italian, Greek, and Turkish units, and similar exercises in the eastern Atlantic with British, French, and Dutch ships. In addition, several small-scale exercises in Arctic waters have been used to test the efficiency of equipment and the reaction of personnel to conditions of severe cold. A large-scale convoy exercise was also carried out by the Atlantic Fleet during March of this year.

BATTLESHPIS

There has been little change in the naval situation as regards battleships since last year. The three ships of the 45,000-ton 'Iowa' class—Missouri,

New Jersey, and Wisconsin—are still in full commission and the first two have seen active service during the year in Korean waters. The New Jersey was hit by shore batteries in May, 1951, but suffered no appreciable damage. After her duties in Korea the Missouri joined the Atlantic Fleet, where at the time of writing she was still serving. The Wisconsin is also in the Atlantic, where she is used for the training of reserves. The Iowa herself has been taken out of reserve and, to use a new American description, "de-mothballed." She is now in what is known as "standby status," ready for quick use if required.

No further decisions have been taken over the fate of the fifth vessel in this class, the Kentucky. She is still laid up at Norfolk, Va., 70 per cent. complete, and is being retained for completion in an emergency. She was originally to have been modified for the employment of guided missiles as main armament. A similar state of affairs is in operation with the Hawaii, of the 27,500-ton 'Alaska' class. She is 82 per cent. complete, and was also destined to be fitted with rocket projectors as her main armament.

AIRCRAFT CARRIERS

There has been considerable and continued interest throughout the world at the building of the James V. Forrestal, which will set a new standard in carrier design. She will have a displacement of 59,900 tons with an overall flight deck 1,040 feet long and 252 feet wide. But by far the most notable feature about her design is a retractable bridge, which will give her, in operation, a completely flush deck. More powerful catapults and stronger arrester gear will enable her to operate larger and heavier aircraft, while higher hangar decks and larger lifts should promote ease in stowage and handling. It is reported that the new ship, which is using material prepared for the former giant carrier United States, cancelled two years ago, is progressing fast and is expected to be launched next year. The Secretary of the Navy, in a speech in Washington early this year, said that plans had been made to build one of these giant carriers each year for the next ten years. He forecast, too, that some of the later ones will be powered by atomic energy.

The bill introduced into Congress by Representative Carl Vinson, chairman of the House Armed Services Committee, asked for funds to build a second carrier this year, but no details about her size have been given. That she will be smaller is implied by the fact that the vote for new construction, amounting to \$1,150,000,000, allows for only one carrier up to 60,000 tons. The estimated cost of the Forrestal is \$228,000,000.

In the meantime the modernisation programme of the 'Essex' class is continuing. Among those recently completed or taken in hand are the Bennington, Bon Homme Richard, Hancock, Hornet, Kearsarge, Lake Champlain, Lexington, Randolph, and Wasp. Two more have been taken out of Reserve and placed on "standby status." The Saipan, a small carrier of 14,800 tons, and her sister ship Wright, are now used for experimental and training purposes respectively, jet fighters being tested in the former. The still smaller Tripoli, an escort carrier of 7,800 tons, has been refitted and re-commissioned. She is being used to carry fighter aircraft to Europe under the mutual defence assistance programme.

CRUISERS

The Task Force Command ship *Northampton* was launched last year and is due to be completed this year. Her expected date of commissioning is November 30, 1952. As completed, she is to be 17,000 tons and so equal in size to the 'Des Moines' class, the heaviest cruisers in the United States Navy. Her designed speed is 33 knots and her main armament consists of four 5-inch dual-purpose guns in single turrets, two forward and two aft. She also carries eight 3-inch anti-aircraft guns in twin turrets, two on each side amidships.

The *Northampton* has had a chequered history. She was originally to have been one of the 'Baltimore' class but was re-designed during building as a modified *Oregon City*. She was cancelled when the war ended in 1945, being then just over 50 per cent. built. In 1948 she was re-designed again as a Task Force Command ship, with more extensive accommodation and much improved communications equipment. She has, like the *Salem* and *Newport News*, a very extensive air-conditioning installation.

The two heavy "Baltimore" class cruisers *Boston* and *Canberra*, of 13,600 tons, are to be converted into guided-missile ships. Both have been laid up at Bremerton since 1946.

DESTROYERS, SUBMARINES, ETC.

The *Norfolk*, formerly classed as a cruiser, has been re-rated as a destroyer leader. She is due to complete in June, 1952. A second ship of this class was authorised in 1947, but there are no indications that she has yet been laid down. This is the much advertised "hunter-killer" ship, specially designed for anti-submarine operations. She is, when completed, expected to be of 5,500 tons—a truly mammoth destroyer—and her designed speed is in the neighbourhood of 35 knots. Details of her final armament are still lacking, but it has been reported, in general terms, that she will carry every known anti-submarine device "and then some."

Also re-rated as destroyer leaders are the four 'Mitscher' class craft of 3,675 tons. They are reported to be long-range fleet destroyers for anti-submarine duties, a somewhat odd description which does not make clear their ultimate purpose. They are due to be completed in 1952. Equally obscure at the moment is the performance of the *Timmerman*, which was commissioned late in 1951. She is officially described as the prototype of a new class, but is in fact a modified *Gearing* boat completed to a new design which is popularly supposed to incorporate some form of gas turbine propulsion. Her completion and commissioning last year might, perhaps, be taken as an indication that this popular belief is a misapprehension, since it is not believed that the marine gas turbine has yet been sufficiently developed in the United States to allow of incorporation in so large a ship as a destroyer. It is known that experiments have been carried out in the United States Navy with the superheating of steam to much higher temperatures than normal, and as it has been stated that, in her design, "more powerful machinery of light weight" is employed, possibly the *Timmerman* is a normal steam turbine ship using light-weight alloys in her machinery and superheated steam at a very high temperature.

Two new escort craft of 1,450 tons of a new anti-submarine class are projected under the 1951 programme, of which one, to be named *Dealey*,

has been ordered. No further details have been reported beyond the fact that they are estimated to cost \$15,000,000 each, which points to the lavish equipment with which most American ships are now fitted, especially in the department of electronic gear.

In the world of submarine development the main interest lies in the atomic-powered boat, which is under construction by the Electric Boat Company. Not unnaturally, details of this boat are kept highly secret, and beyond a report that progress is satisfactory no details are available. According to reports from Washington, a second boat with similar propulsive arrangements is to be ordered this year.

The authorities are equally reticent about the progress of the other experimental boat, which is to be powered with a closed-cycle hydrogen-peroxide engine of the Walther type. She is being built at Portsmouth Navy Yard at an estimated cost of \$37,000,000. Closed-cycle propulsion is, of course, under active development by all major navies, and it is impossible to estimate who is at present leading in the race. But it appears, on the face of it, that no other foreign navy has yet any boat actually laid down and building for this type of propulsion.

Three other experimental types of submarines are under construction in the United States. The first of these, the Albacore, is a high-speed underwater target type, and is due in the middle of 1953. She is a boat of 1,100 tons and is expected to produce her high underwater speed by normal or improved "Guppy" methods. The second is a small coastal type of 250 tons, due to complete at the end of this year. The third are the three "submarine-killers" of 765 tons, designed specifically for anti-submarine duties. These are known as K1, K2, and K3, but beyond the fact that they are to carry homing torpedoes, no other details of their equipment have yet been made public.

The main submarine building programme, of course, is devoted to the six "attack" type boats of the 'Tang' class. Three of these, the Tang, Trigger, and Trout, were launched during 1951, and the remaining three, Wahoo, Gudgeon, and Harder, should join them in 1952. These boats are rather shorter than the 'Corsair' class of similar tonnage, measuring 268 feet overall in comparison with about 306 feet in the "Guppy" conversions of the 'Corsairs.' It has been stated that the reduction in overall length assists underwater speed. The designed submerged speed is 17 knots, with a maximum of 20 knots on the surface.

These six boats have a completely new type of diesel engine, consisting of a 16-cylinder, 2-cycle plant mounted vertically with the cylinders in four rows radially arranged. Full-power bench tests are reported to have given considerably increased power at a very much lower weight than a normal submarine diesel.

In the meantime the "Guppy" conversion programme is being continued as a short-term project dependent on the final results and trials of the two experimental fast boats, which is, of course, the long-term approach to the problem. Other developments reported are the conversion of the Tunny to a guided-missile submarine, in which category she will join the Cusk and Carbonero; and of seven of the 'Gato' class—Grouper, Bluegill, Angler, Bashaw, Bream, Cavalla, and Croaker—to submarine killers.

A considerable programme of new building is also under way in the smaller categories of warship, chiefly minesweepers: the 1952 programme

calls for thirty more of these craft, a continued indication that the mine is still considered one of the more important of the weapons at sea. This is in addition to the 106 authorised under the 1951 programme, most of which are still building. Most foreign navies have been active in the development of new types of mines, and their sweeping has called for new techniques and largely increased numbers of sweepers. Among other minor war vessels under construction in the United States are 70 tank landing craft.

NAVAL AVIATION

The 1952 budget allocated \$4,022,000,000 to the Navy to buy aircraft, though no figures are given of the number concerned. On a rough estimate of comparative figures for the Air Force, this works out at approximately 2,000 aircraft, but such an estimate may well be misleading in view of the very costly technical equipment with which naval machines are fitted.

A number of somewhat bellicose speeches in the United States have recently stressed the ability of the American Navy to carry and deliver the atomic bomb. Thus Mr. Kimball, in a Press conference at Washington, has "guessed" that the United States Sixth Fleet in the Mediterranean is prepared to use atomic bombs if necessary in the defence of Western Europe—the first hint that any warship is now prepared to deliver the bomb. A month later Admiral Fechteler said in a speech that the Navy was able to carry "an atomic bomb or many atomic bombs on the seas to a target within the range of action of carrier-based aircraft—a distance of some 600 miles." The aircraft in question is presumably the Neptune, which two years ago demonstrated its capability of flying off and landing on an aircraft carrier.

The Neptune is certainly a major achievement in naval aviation design. As well as being a long-range bomber, it has proved itself to be a first-class anti-submarine weapon, and its increasing use with other Western navies is a tribute to its all-round excellence and versatility. The new P.2-V.5 model has a nose turret with cannon instead of machine-guns as in the former models, and last year it established a long-distance flight record "non-refuelled," flying non-stop from Perth, Australia, to Columbus, Ohio, a distance of 11,236 miles.

The Navy has under development a new engine designed by the Westinghouse company. This is the J.40 turbo-jet, developing 14,000-lb. thrust. It is stated that when fitted with an after-burner, the thrust developed is nearly doubled.

FRANCE

During 1951 Admiral R. G. Lambert was replaced as Chief of Naval Staff by Admiral H. L. Nomy, an expert on naval aviation. The reason given was ill-health, but later in the year Admiral Lambert was appointed Premar III at Toulon. The new Commander-in-Chief Mediterranean is Admiral Sala, with Vice-Admiral P. J. Ronarc'h in a new appointment as Commander French Naval Forces in the Mediterranean.

Last year a programme of new construction was adopted under which 50,000 tons of warships were to be built during the years 1950–55. The 1950 and 1951 programmes were thus absorbed into this total, to which should

now be added the 1949 programme of one large anti-aircraft destroyer, two smaller *escorteurs océaniques*, two submarines of 1,200 tons, and a few minesweepers and auxiliary vessels. Including the 1949 programme, current orders in hand consist of six anti-aircraft destroyers, known as *escorteurs rapides*, four *escorteurs océaniques*, four 1,200-ton submarines, and six small minesweepers. This programme falls somewhat short of the previous target figure of 380,000 tons previously announced, but some of the deficit should be made good by transfers from Great Britain and the United States.

The battleship Jean Bart, completed late in 1950 apart from the fitting of her anti-aircraft guns, has now had these installed. She carries twenty-eight 57-mm. and eight 20-mm. Oerlikons, as well as a dual-purpose secondary armament of nine 6-inch and twenty-four 3.9-inch. She is now in the Mediterranean Fleet. The Lafayette, formerly the United States light fleet carrier Langley, is in commission and carries American Helldivers and Hellcats, which types of aircraft are also carried in the other light fleet carrier Arromanches. This carrier, as H.M.S. Colossus, was on loan to France from Great Britain for a period of four years, but was purchased outright in 1951 for the sum of £1,500,000.

The De Grasse still awaits completion at Brest, where she has been lying since being laid down in November, 1938. She will become France's first anti-aircraft cruiser and is to carry sixteen 5-inch anti-aircraft guns in twin turrets, twenty 57-mm., and numerous Bofors. She has been designed for a speed of 33 knots.

The most interesting ships in the French Navy are, however, the new *escorteurs rapides*, of which six are building, three at Lorient and one each at Bordeaux, Nantes, and Brest. Although these are officially designated as anti-aircraft vessels, and indeed carry as main armament six 5-inch anti-aircraft guns in twin turrets, six 2.25-inch (57-mm.) anti-aircraft guns, and several smaller anti-aircraft weapons, they would appear to be equally formidable anti-submarine vessels. They carry a squid projector forward and would inevitably be fitted with Asdic and every modern submarine detector device. Their designed speed of 32 knots at full speed should enable them to deal very effectively with the newer submarines. These six boats are of 2,700 tons.

The *escorteurs océaniques*, of which four are under construction, are diesel-engined vessels of 1,250 tons with a designed speed of 26 knots. They are mainly anti-submarine vessels, though with a heavy anti-aircraft armament. They have a very large endurance.

Eight more destroyer escorts have been transferred from the United States, to make twelve in all. These are now the 'Sénégalaïs' class of 1,275 tons with diesel-electric installation giving a maximum speed of 19 knots and a radius of action of 11,500 miles at economical speed. The boats concerned are Algérien (ex-DE 107), Hova (ex-DE 110), Marocain (ex-DE 109), Sénégalaïs (ex-DE 106), Somali (ex-DE 111), Tunisién (ex-DE 108), Arabe (ex-Samuel B. Miles), Bambara (ex-Sweare), Kabyle (ex-Riddle), Sagalave (ex-Wingfield), Soudanais (ex-Cates), and Touareg (ex-Bright).

Four British submarines have been lent to the French Navy for a term of four years without payment. They have already been allotted French names and are Le Saphir (ex-Satyr), La Sibylle (ex-Sportsman), La

Sirène (ex-Spiteful), and La Sultane (ex-Statesman). These are the 'S' class boats of 715-1,000 tons, and the loan is to promote anti-submarine training in the French Navy. The new construction of four boats of 1,200 tons seems to be making slow progress, no details having been issued since these notes were written last year. The four boats are all being built at Cherbourg.

Naval aviation is under constant development in France and is probably the strongest branch of the French Navy. Present plans are to build up to a strength of 400 operational aircraft, with approximately half that strength in communication and training machines. There is no lack of pilots or aircrew, and the aviation service is so popular that it attracts more volunteers than can be accepted.

RUSSIA

Reports from behind the Iron Curtain are still most vague and unreliable, and it is extremely difficult to obtain any reliable picture of the Russian Navy as it exists to-day. Swedish newspapers still carry reports that the new Russian battleships are in being, but the lack of substantiating evidence from any other source must make it extremely doubtful whether these ships have any real existence except in the imaginations of some Baltic journalists. Russian propaganda announcements have sedulously refrained from any announcement of their existence, and this in itself can be taken as another indication that the reports of Russian battleships from Scandinavian countries have no basis in fact. Propaganda in the past has lost no opportunity of dilating on the achievements of Soviet rule, and it is reasonable to conclude that the building and commissioning of a battleship would have been the subject of some laudatory comment.

That being so, it seems reasonable to conclude that the many reports of new building and trials of large ships in the Baltic must have referred to the new cruisers now being built. These are the 'Sverdloff' class, of which it is believed that at least six are under construction. One report from the Baltic states that a cruiser with an estimated displacement of 12,000 tons was seen on trials late in 1951, and the assumption is that this is the first of the new class, though at least two more should have been launched and be nearing completion by now. They are believed to carry nine 8-inch guns in triple turrets, together with a heavy anti-aircraft armament.

The other modern cruisers possessed by Russia are the six vessels of the improved 'Kirov' class, of about 10,000 tons. Two of these, the Tchapayev and the Zhelesnykov, are reported to be in the far north, the remainder being in the Baltic. These are ships of 10,000 tons carrying twelve 7·1-inch guns in four triple turrets.

Building has continued with the well-tried 'O' class of destroyers, but to an improved design. Approximately four of this class are built every year, and they must be considered satisfactory in the Russian view, although to Western eyes they might appear to lack the necessary robustness of a fleet destroyer. They are credited with a speed of 40 knots and carry four 5·1-inch guns and eight 21-inch tubes as main armament.

It is, however, the Russian submarine fleet that attracts most interest in Western countries. Estimates of its strength have remained more or less static throughout the year, again varying between 350 and 400. This sounds alarming enough, though it must be stressed that something like a quarter

of this total consists of coastal submarines, and that the remainder are subject to a very wide dispersal between the Pacific, the Arctic, the Baltic, and the Black Sea.

There has been more than one indication in the Scandinavian press that the new boats joining the fleet have not proved entirely satisfactory according to modern standards. They are said to lack some items of equipment which would be considered necessary in other navies, and also that design and performance are unnecessarily rigid. This may be, of course, wishful thinking, and it would be unwise to pay much attention to the reports. There are, as yet, no indications that the Soviet Union has mastered the design of the closed-cycle engine and one suspects that the present Russian submarine fleet consists of conventional boats with the ordinary submarine diesel. The schnorkel, of course, is a standard fitting, but this no longer poses such difficult problems of detection as it used to do. It is stated that at least 120 boats are in various stages of construction in the Baltic and Black Sea shipyards. While this is an impressive number by any standard, it is probably not more than barely sufficient to maintain the operational fleet at its present strength. Many boats now in commission are obsolete by modern standards and must be very near the end of their useful life.

Russian naval aviation, entirely shore-based, was brought prominently to the notice of the public last year by the display of new twin-jet bombers on Navy Day. Again, no reliable details are available of the full strength of the naval air arm, although a Scandinavian report gives the strength in bombers, fighters, and reconnaissance machines as over 2,500. But it can only be a defensive arm by reason of its comparative immobility and the lack of any carrier to transform it into an offensive weapon.

A major work in Russia, which when finished will have a profound effect on Soviet naval strategy, is the Volga-Don canal, which should now be nearing completion. This is the final link in the chain of rivers and canals which link the White Sea with the Black Sea. It will, of course, at last bring a new degree of homogeneity to the Russian fleets in European waters and make possible the concentration of smaller warships at least at any desired point.

ITALY

The formation of a Southern Command by the North Atlantic Treaty Organisation is bound to have a beneficial effect on the Italian Navy, although it is too early yet to judge what the final result will be. Under the Peace Treaty, Italy is limited to a total naval tonnage of 67,500, in addition to the two old battleships Andrea Doria and Caio Duilio, but the terms of that treaty permitted modernisation to begin in 1950. Under the Mediterranean Command of Admiral Carney, whose headquarters is at Naples, it is to be expected that modernisation and replacement will be greatly accelerated to permit the Italian Navy to play its part.

Two destroyers and six gunboats were handed over at Brindisi by the United States at the end of 1951. The destroyers are the Artigliere (ex-U.S.S. Woodworth) and the Aviere (ex-U.S.S. Nicholson), and are standard American boats of 1,620 tons with a speed of 37 knots. Also now rated as destroyers are the two 'Regolo' class cruisers Giulio Germanico and Pompeo Magno, which have been stripped down to the hull and are

being re-constructed as anti-aircraft destroyers. On completion they are to be renamed San Giorgio and San Marco.

New construction forecast under the 1951 programme consisted of six escort vessels, of which two were to be of 2,500 tons, four small coastal boats for anti-submarine work, and six minesweepers. So far there has been little or no progress with any of these vessels, mainly because of the financial stringency which almost paralyses the country.

The Naval Air Arm has been reconstituted under the name "Marinavia," but it is under the control of the Air Force and there is little co-operation between the two Services. It is equipped with 24 Helldiver machines provided by the United States, but these are commanded and piloted by the Air Force. The Navy, however, hopes to take them over as soon as sufficient officers have been trained.

OTHER EUROPEAN COUNTRIES

BELGIUM

The Belgian Navy if still small is extremely efficient, and its performance in exercises with other navies is quite outstanding. It is, of course, not a combatant navy in the accepted meaning of that term, but is based mainly on an efficient minesweeping force. The backbone of this force consists of the six 'Algerine' class minesweepers transferred from Great Britain, with a further eight coastal boats. Eight more of these coastal boats are to be built in the near future.

The *Force Navale Belge* is administered by the Ministry of National Defence, there being no separate Admiralty. The Chief of Naval Staff, Commander L. J. J. Robins, has recently been promoted to the rank of Captain.

DENMARK

A small programme of naval expansion has been adopted by the Danish Defence Ministry, designed to take effect by 1954, but it is not thought that the full details have yet been decided. The two coastal destroyers Willemoes and Huitfeldt are being re-armed with 21-inch torpedoes instead of the 18-inch they now carry, and the new minelayer Langeland is now in commission. Three small submarines of 500 tons displacement are being laid down in Copenhagen, and it is hoped to add them to the fleet in 1953.

GREECE

Two American destroyers, Doxa (ex-U.S.S. Ludlow) and Niki (ex-U.S.S. Eberle), and four American frigates, Aetos (ex-U.S.S. Slater), Ierax (ex-U.S.S. Ebert), Leon (Ex-U.S.S. Eldridge), and Panther (ex-U.S.S. Garfield Thomas), were transferred to Greece during 1951 under the Mutual Defence Assistance Programme. These, with the 2 destroyers, 17 frigates, and 6 submarines on loan from Great Britain, give Greece a reasonably modern navy for Mediterranean purposes.

The ex-Italian cruiser Eugenio di Savoia has now been transferred to Greece under the terms of the peace treaty. She has been reconditioned at Taranto and is now named Helle II. Of 7,280 tons, she carries eight

6-inch guns in twin turrets, six 21-inch torpedo tubes, and a useful anti-aircraft armament. She has a designed speed of 36 knots, and now replaces the ancient cruiser *Averoff*, which, after nearly forty years of service, is to be scrapped.

NETHERLANDS

Of a total defence budget of £150,000,000 for 1952 the Dutch Navy is to receive £34,700,000. This, while not sufficient to implement the ambitious building plans of three years ago, will enable Holland to maintain her present considerable fleet and continue work on outstanding construction. The original plans have, indeed, already been largely shelved as beyond the economic capacity of the country, and the present intention is to form a balanced navy based on a carrier. This, the *Karel Doorman*, has been extensively refitted and is now again in full commission.

Work has been speeded up on *De Zeven Provincien*, which was launched by Queen Juliana in August, 1950, and she was expected to be completed in mid-1952 rather than in 1953 as was originally forecast. There are no indications of the rate of progress of her sister ship *De Ruyter*, though she was launched as long ago as 1944.

Four more American escort destroyers, classed in Holland as frigates, have been handed over by the United States, as forecast in these notes last year. They are the *Dubois* (ex-U.S.S. *O'Niell*), *Van Ewijck* (ex-U.S.S. *Gustafson*), *De Zeeuw* (ex-U.S.S. *Eisner*), and *van Zijll* (ex-U.S.S. *Stern*). They join the *De Bitter* and *Van Amstell* to make a class of six of these boats.

Present intentions are to build 12 new destroyers, of which 6 are due for completion by 1953, and 4 submarines, the whole to join the fleet by 1955. The destroyers, which are to be anti-submarine boats, will be of 2,100 tons, armed with four 4·7-inch guns and depth-charge throwers, together with a Squid or Hedgehog fitting. Their names are reported to be *Amsterdam*, *Drenthe*, *Friesland*, *Gelderland*, *Groningen*, *Holland*, *Limburg*, *Noord-Brabant*, *Overijssel*, *Rotterdam*, *Utrecht*, and *Zeeland*. Of the four submarines no details are yet available. In addition to the above programme, it is hoped to acquire several minesweepers from the United States under the Mutual Defence Programme.

Work at Den Helder has been continued throughout the year, and it is hoped to complete it as a base capable of handling major warships by the end of 1952.

NORWAY

Commodore *Skule Valentin Storhei* has been promoted Vice-Admiral and Commander-in-Chief of the Norwegian Navy in succession to Admiral *Thore Horve*, who resigned on October 1, 1951. Admiral *Horve* himself relieved Admiral *Danielsen* earlier in the year.

Two more 'Hunt' class destroyers, rated in the Norwegian Navy as frigates, are to be lent by Great Britain. They will join the *Narvik* (ex-H.M.S. *Glaistead*) and *Arendal* (ex-H.M.S. *Badsworth*). From the United States have come four M.T.Bs., with six more promised, together with a few mine-sweepers and minelayers.

The destroyer *Aalesund*, reported as completed last year, has been scrapped. She was extensively damaged by sabotage during the war.

PORTUGAL

The two ex-British frigates Nuno Tristão and Diego Gomes and the three ex-British 'S' class submarines Narval, Nautilo, and Neptuno form the backbone of the small Portuguese Navy. They are the only modern vessels in the fleet, the remaining ships being all of pre-war vintage with the exception of six small patrol craft built in Great Britain during the early years of the war. Lack of funds is stated to be a serious hindrance in the efficient upkeep and modernisation of the Navy.

ROUMANIA

There have been reports during the year that the small Roumanian Navy has received four submarines from Russia. If it is true, these would certainly be small coastal-type boats for use in the Black Sea. The remainder of the Roumanian Navy, which consists of two destroyers, one submarine of doubtful value, and miscellaneous small craft, is completely obsolete by modern standards.

SPAIN

The old cruiser Navarra, due to be scrapped last year, has been given a new lease of life as an accommodation ship. The ex-Italian Trieste, which had been sunk during an air attack at Maddalena in 1942 and raised in 1950, was purchased last year with the somewhat ambitious intention of converting her into an aircraft carrier. However, she is now to be scrapped in place of the Navarra.

Four of the 'Audaz' class destroyers, laid down in 1945, have at last left the building slip. The Audaz herself was launched in January, 1951, and the remaining three in the following September and named Osada, Meteoro, and Rayo. It is expected that two more will be launched during 1952. The second boat of the 'Alava' class, of 1,635 tons, was completed in 1951 and named Liniers. Work has begun at Ferrol on the new 'Oquendo' class boats, but judging by recent experience it will be some appreciable time before the first hulls will be ready for launching. These are to be destroyers of 1,950 tons displacement carrying eight 4-inch anti-aircraft guns in twin mountings. They have a designed speed of 39 knots.

Two of the new 'G' class submarines have been completed, and the remainder are reported to be well advanced. These are medium-sized boats of 760 tons, ordered in 1945, and based on the design of the well-known 750-ton U-boats turned out in such great numbers by Germany during the war. Two of the seven new minesweepers under construction last year have now been commissioned, but work on the remainder seems to be progressing very slowly.

A large programme of reconstruction is being carried out at Ferrol to bring the base completely up to date. A new dry dock is proposed and schemes to modernise the existing dockyard installations and facilities are to be put in hand.

SWEDEN

Little new building has been reported during the past year, apart from small craft, but a fairly extensive programme of refit and modernisation has been carried out. Four destroyers of the 'Göteborg' class have been taken in hand for extensive modernisation, being fitted with eighteen

rocket-launchers each, and completion of the refit of the Ehrensköld and Nordenskjöld has been reported. These two old destroyers have been converted into fast anti-submarine frigates with a strong anti-submarine armament.

Nine submarines have also been taken in hand for extensive refit. This includes the fitting of asdic and schnorkel and a certain degree of additional streamlining of hulls. Although Parliament has voted the requisite funds, no work has apparently been started on the three 800-ton submarines Hajen, Sälen, and Valen, though it is expected that contracts will be placed in 1952.

Ten M.T.Bs. of conventional design are building, and a large experimental boat is also under construction. It has been reported that this will carry special long-range torpedoes of a new design.

TURKEY

The two submarines handed over to Turkey by the Americans last year have been renamed Canakkale (ex-Blower) and Dumlupinar (ex-Bumper). They complete a class of six ocean-going vessels of 1,526 tons displacement.

YUGOSLAVIA

The destroyer Split should by now be completed, though reliable information from Yugoslavia is still hard to come by. She was launched as long ago as 1940, but, of course, all work on her was stopped during the war. She is of 1,875 tons and was to have carried, in her original design, five 5·5-inch guns and six 21-inch torpedo tubes in triple mountings. One report mentions that two sister ships of the Split are building, but in view of the financial stringency in the country the report should be treated with reserve.

There are no indications as to the progress of the new torpedo-boats of 500 tons, of which an unknown number, varying from three to six, are supposed to be under construction at Fiume. Equally obscure is the situation in regard to the new submarines, also reported in varying numbers of three to six, supposedly building at the same place. One German and two Italian submarines are stated to have been raised, found in good condition, and to be refitting for service in the Yugoslav Navy. The German boat is believed to be U.81, and one of the Italians to be the Nautilo.

The ex-Italian Balestra, a small destroyer of 800 tons of the 'Ariete' class, has been renamed Učka.

AMERICAN COUNTRIES

ARGENTINA

The two American 'Brooklyn' class cruisers Phoenix and Boise have been purchased by Argentina for \$7,800,000 and renamed Diecisiete de Octubre and Nueve de Julio respectively. These two cruisers, completed in 1939, are each of 10,000 tons and carry four aircraft. They were completely reconditioned by the United States before being handed over.

Two more frigates of the 'King' class, to be named Azopardo and Piedrabuena, are under construction at Rio Santiago. When completed they will join the King and Murature to form a second flotilla of four frigates.

BRAZIL

The old battleship Minas Geraes is no longer operational but is being retained as the headquarters ship of the Commander-in-Chief.

Brazil purchased last year the two 'Brooklyn' class cruisers Philadelphia and St. Louis from the United States for the same sum as paid by Argentina. They have been renamed Almirante Barroso and Almirante Tamandare respectively.

The last four of the six 'A' class destroyers were completed last year and are the Acre, Ajuricaba, Apa, and Araguari. They join the Amazonas and Araguai, both completed in 1949. They are boats of 1,450 tons and carry as main armament four 5-inch guns and twelve 21-inch tubes in quadruple mountings. It has been reported that a further six boats of this class are to be built. Eight destroyer escorts are to be transferred by the United States to Brazil under a mutual defence agreement, but the names have not yet been announced.

CHILE

As with Argentina and Brazil, two 'Brooklyn' class cruisers have been sold by the United States to Chile for a similar sum. They are the Nashville and Brooklyn, and their new names in the Chilean Navy are Capitan Prat and O'Higgins.

PERU

Three escort destroyers are to be transferred to Peru by the United States under a mutual defence agreement. It has been stated that these will be 'Captain' class boats, but individual names are not yet available.

URUGUAY

Uruguay is to receive two destroyer escorts from the United States under terms of mutual defence similar to those in Brazil and Peru. The boats in question are reported to be U.S.S. Baron and U.S.S. Bronstein, but the Uruguayan names for these two are not yet known.

VENEZUELA

The two destroyers building at Messrs. Vickers-Armstrongs, Barrow-in-Furness, for the Venezuelan Navy are to be named Nueva Esparta and Zulia. They are reported to be boats of 2,600 tons, but details of armament, speed, etc., are lacking. A contract for a third boat of this class was signed with the same builders in July, 1951.

OTHER COUNTRIES

BULGARIA

A report has been received to the effect that the tiny Bulgarian Navy has received a destroyer from Russia, but no details are given. Under the terms of the peace treaty the Bulgarian Navy is limited to a total of 7,500 tons.

BURMA

Ten coastguard cutters have been transferred to the Burmese Navy by the United States under the Mutual Defence Assistance Programme. They are being converted in Burma for use as gunboats to patrol navigable rivers.

CHINA

The situation in China has remained static during the past year, with the Chinese Navy still more or less equally divided between the Nationalists on Formosa and the Communists on the mainland. The more important vessels in Communist hands are believed to be the frigates Hui An, Chang Pei, Chi An, Hein An, Wei Hai, Kao-An, and Te-An.

EGYPT

The three fleet minesweepers acquired from Great Britain have been re-armed and rated as corvettes. They are the Matruh (ex-Stornoway), Nasr (ex-Bude), and Sollum (ex-Wedgeport).

POLAND

The Polish Navy, though small compared with those of most other countries, is yet the largest among the Soviet satellite states. It consists of one comparatively modern destroyer of 2,144 tons, the Blyskawica, three submarines, the Sep, Rys, and Zbik, all of around 1,000 tons, and numerous small craft. Fleet bases are at Gdynia and Swinemunde, with a smaller base under development at Hel.

The Navy's role is mainly coast defence. It is completely subservient to Russia, being under the command of a Soviet rear-admiral, with other Soviet officers holding the senior appointments. There is a small naval air arm, based ashore.

SOUTH KOREA

The stress of war in Korea has resulted in a further small increase in the size of the R.O.K. Navy, mainly by the transference of miscellaneous small craft from the United States. Two of the minesweepers transferred are no longer operational, AMS 516 being mined and sunk in Wonsan Harbour, and AMS 504 being so severely damaged by a mine explosion that she cannot be adequately repaired.

“ SPINDRIFT ”

CHAPTER XIII

THE WORK OF THE NAVY IN THE SUEZ CANAL, 1951-52

FROM TIME to time many duties besides fighting fall to the Services, particularly to the Royal Navy. Police work in unexpected emergencies, in many parts of the world, is an ever-present possibility. But that, perhaps, differs only in degree from actual active service; for while it calls for the discipline and restraint which are the most notable characteristics of the British Services it consists essentially in the exercise of force where it is needed. But there are other duties which call for the same qualities in their discharge, yet have nothing in common with fighting. The succour of earthquake-stricken people—those at Messina, Tokyo, and in Chile will be remembered—or the rescue of refugees from the violence of civil wars—as from the Ukraine in 1920 and from Spain sixteen years later—are examples. The latest was the work of the Royal Navy in maintaining the flow of traffic through the Suez Canal when the disturbances in Egypt in 1951-52 threatened to have the effect of holding it up.

The Suez Canal is an international waterway of the first importance to the economic well-being of a great part of the world. The disturbances in Egypt, though ostensibly directed against Britain alone, would have greatly accentuated many of the world's economic difficulties if they had been allowed to paralyse the working of the Canal. They called for the police work of which mention has been made, and that was the function of all three Services. But on the Navy fell in addition the duty of serving the world at large by supplying, at a moment's notice, the transport services for Canal traffic which had hitherto been the function of commercial organisations which the Egyptian terrorists had succeeded in holding up. For the comprehension of this work a brief survey of the history of the Canal is useful.

HISTORY OF THE CANAL

The Suez Canal Company operates under a 99-year concession, granted in the middle of the last century by the Khedive, the Turkish Viceroy of Egypt, to the French engineer Ferdinand de Lesseps. The concession allowed de Lesseps to form the Universal Suez Maritime Canal Company for the cutting and subsequent operating of the Canal. The Canal is Egyptian property, the Company an Egyptian concern subject to the laws of Egypt; and when the concession expires in 1968 everything reverts to the Egyptian Government. The main provisions of this agreement as it affected other countries were that the Canal dues should be equal for all nations and that no particular advantage could be obtained by any one country.

The Canal, which is 101 miles long, opened in 1869, and its immense international importance at once became apparent. Shipping companies, however, were in no hurry to make use of the facilities, and there were

acute financial difficulties in the early days. The Turkish Government made it clear, however, that the Canal was not for sale, and gradually the financial position improved. The year 1875 saw the famous purchase by Disraeli of the Khedive's Canal shares, by which Britain acquired nearly half of the total Canal shares and became the largest shareholder. With France holding most of the remainder of the shares, Britain and France therefore developed a common interest in the freedom of the Canal and also in the proper administration of Egyptian affairs, which had deteriorated to a state of bankruptcy.

Turkey replaced the Khedive by another, and Egyptian financial matters were placed under dual Anglo-French control in 1876. Meanwhile, there was much discontent in Egypt and the growth of a nationalist spirit. Matters came to a head in 1882 with an army revolt under Colonel Ahmed Arabi. Rioting broke out in Alexandria on July 11, 1882, and in violent anti-foreign disturbances more than fifty Europeans were killed. The Sultan of Turkey, however, refused to send troops, the French Government would not take action, and it was left to Britain to deal with the dangerous situation. On July 11 the British fleet shelled the forts at Alexandria, and on the 24th British forces landed and occupied the port. The free passage of the Canal was endangered, and the Khedive himself authorised British forces to safeguard it. The British expedition arrived only just in time to prevent the Egyptians from carrying out Arabi's orders to block the Canal. The revolt was crushed at the battle of Tel-el-Kebir, and Britain occupied Egypt. The dual control with France came to an end and Egypt became virtually a British protectorate.

The British Government, however, was ready to enter into guarantees with other powers to ensure the freedom of the Canal, and in 1888 a Convention was signed by Great Britain, France, Germany, Austria-Hungary, Italy, Russia, Spain, Turkey, and the Netherlands. The first article of this Convention stated, "The Suez Canal shall always be free and open, in time of war as in time of peace, to every vessel of commerce or war, without distinction of flag. Consequently, the High Contracting Parties agree not in any way to interfere with the free use of the Canal, in time of war as in time of peace. The Canal shall never be subjected to the exercise of the right of blockade."

THE SUEZ CANAL COMPANY

The Canal enterprise is run by the Canal Company Board, which includes representatives of the principal users. There are 32 directors, comprising a French president, 15 French directors, 10 British, 1 United States, 1 Dutch, and 4 Egyptian. The staff of the Company in Egypt, not including pilots, numbers about 550, some 240 of them being Egyptians. All the key men and a large majority of the European staff are French. The Company also employs some 4,150 workmen of all kinds, three-quarters of the number being Egyptians. There are 165 Canal pilots, including 50 British, 50 French, and 17 Egyptians, although only a few of the latter are fully qualified to take charge of a ship in the Canal.

A complex organisation is required to operate the Canal and to administer its varied European and native employees. In addition to the pilots, the company maintains salvage and fire services, a fleet of dredgers, tugs, and other craft, large numbers of buoys and lights, mooring facilities, telephone

and radio communications, signal stations, roads, water-works, a hospital and medical services. Constant dredging is necessary to maintain the depth of the Canal and to accommodate the vessels of ever-increasing draught that use it; and erosion of the banks must be prevented.

In 1949 an agreement was concluded to regulate the relations of the Company and the Egyptian Government until the end of the Convention, and it was agreed that increasing numbers of Egyptians should be trained in the running of the Canal in order to be able to take it over in 1968.

ANGLO-EGYPTIAN AGREEMENTS

Egypt was granted full independence in 1922 and inherited the rights and duties of Turkey; and by a treaty, Britain and Egypt became joint rulers of the Sudan. Under the treaty British troops were to be stationed in Egypt to defend the Canal.

When the 1922 Treaty expired in 1936 Nahas Pasha, then Egyptian Prime Minister, requested a renewal of the treaty for twenty years. This new treaty, however, brought the military occupation to an end, though the British were authorised to station forces upon Egyptian territory in the vicinity of the Canal until both Britain and Egypt were satisfied that the Egyptian Army was capable of defending the Canal without outside help. The 1936 Treaty entitled the British to establish a five-mile defence belt on either side of the Canal from Kantara, thirty miles south of Port Said, to Suez. Training areas were established for the Army, and flying facilities for the Air Force. The strength of the British forces was to be reduced to 10,000 combatant land forces, 400 Air Force pilots and an unspecified number of non-combatants.

World War II saw an immense development of the Canal Zone; camps, store-depots, and airfields multiplied; and by the end of the war Britain had well over a million troops and enormous quantities of stores in the Middle East Command. All British forces were withdrawn from the Nile delta by March, 1947, into the Canal Zone, and military, air force, and naval stations were developed along the five-mile Treaty belt. Fayid, twenty miles south of Ismailia, was established as Headquarters, Middle East Land Forces. By October, 1951, the number of troops had been scaled down to only a little over the Treaty figures.

THE OUTBREAK OF VIOLENCE IN OCTOBER, 1951

Since the war Egyptian nationalism has been growing in intensity, and though Britain has been willing to revise the Treaty subject to reasonable safeguards for the security of the Canal, the Egyptians have refused to accept anything short of the complete withdrawal of the British forces. Negotiation has become even more difficult as a result of the further insistence on Egyptian sovereignty over the Sudan. In April, 1951, Britain, the United States, France, and Turkey invited Egypt to take part in joint consultations on Middle East defence, including a scheme for the joint defence of the Canal, but Egypt rejected the proposals. Finally the Wafd Government under Nahas Pasha, encouraged no doubt by the example of the Anglo-Persian oil dispute, denounced the Treaty, demanded the immediate withdrawal of the British forces, and proclaimed King Farouk King of Egypt and the Sudan. Then, when Britain refused to recognise this one-sided abrogation, the Egyptian Government instigated direct action to

make the British position untenable and force them to leave. A campaign of violence and intimidation forced Egyptian labour to withdraw from all co-operation with the British forces, supplies of food and other essential commodities were refused; sabotage and guerrilla fighting broke out. The Egyptian police made no pretence of impartiality but encouraged and sided with the lawless elements; in Cairo young men were openly recruited and trained to act as terrorists, and anti-British hatred was whipped up by the Press and radio in a virulent campaign of false propaganda and accusations of British atrocities.

The British Army took prompt and resolute action to meet the threat of the security of the Canal, to protect British lives and property, to suppress hooliganism, and to maintain the law and order essential for the continued working of the Canal as an international waterway and the safety of the Canal Company's installations, pilots, and employees.

THE CANAL COMPANY AND THE DISORDERS

The Canal Company was faced with a most difficult situation. In theory it was not concerned with the dispute between Britain and Egypt and was merely interested in keeping the Canal open to all ships. It was not in the interests of either Britain or Egypt to interfere with the Canal traffic, and the Egyptians in particular stood to lose from any breach of the 1888 Convention which might arouse opposition to their taking over the Canal in 1968. As things turned out, however, the Egyptians in their eagerness to injure the British provoked a situation which would undoubtedly have brought traffic to a standstill—a situation in which the Canal Company would have been powerless, in spite of the loyalty of its employees—had it not been for the Royal Navy.

THE NAVY STEPS IN

Only the action of the Navy enabled the working of the Canal to continue and saved the Egyptians from the consequences of their action. For one of the essential operations in the passage of the Canal is the berthing and mooring of the ships while waiting their turn to go through or to allow another ship to pass during the passage. Berthing in the Canal has been greatly reduced since the opening of the Farouk Canal last year. Formerly the only place where convoys could pass one another without the ships of one of them having to moor up to the bank was in the Great Bitter Lake, a third of the distance between Suez and Port Said. To improve the situation the Company had dug an eight-mile loop canal about thirty miles from Port Said, providing a second passing place and much improving the safety of the Canal. It is still necessary, however, to berth nearly every ship at Port Said. This berthing work is not carried out by the Company employees but by local contractors or men employed by the shipping agents. All these men came out or were forced out on strike. Moreover, there was a complete boycott of British ships; the dockers who handled and unloaded cargoes all went on strike; no British ship could obtain supplies from Egyptian sources and no Egyptian firm would effect repairs or give assistance of any kind. Merchant ships cannot berth themselves alongside a wharf or moor themselves to a buoy, as normally they do not carry the handy small boats which are needed for mooring or enough deck-hands to be able to send men ashore to handle the berthing

wires. Without assistance to effect repairs it would only have been a matter of time before some ship broke down and traffic was seriously impeded if not halted. A particular danger was the possibility of damage to a tanker, from accident or sabotage, with the risk of a disastrous fire. A berthing organisation was essential if the flow of shipping was to continue, and the arrival and unloading of supplies for the British in the Canal Zone was vital. To meet the situation the Navy stepped in; and while the Army provided men to do the unloading and transport to take the supplies away from the docks, the Navy berthed the ships, manned tugs to tow lighters, worked cranes and winches, and carried out all the necessary repairs to ships and dockside machinery. It was work calling for a degree of professional skill which few possess except Navy-trained officers and men.

On October 17, the day after the Egyptian Government cancelled the Treaty, H.M.S. *Gambia* arrived at Port Said and set up an organisation to ensure the uninterrupted use of the Canal. A Naval Liaison Officer, Port Said, was appointed to act as the link between the Navy and the Canal Company. A Port Committee was formed which consisted of the captain of the cruiser, as chairman; the Naval Liaison Officer; the Garrison Commander, who was ultimately responsible for law and order in the town and its surroundings; the Port Commandant and Port Superintendent, Army officers responsible for the discharge and clearance of all War Department cargoes; the Divisional Sea Transport Officer, Middle East, who acted as the link between the three Services and the shipping firms; two civilians representing the various shipping firms and agencies; and a Royal Air Force officer to co-ordinate air force requirements. The Consul-General, responsible for all British interests in the Canal Zone, attended meetings from time to time.

The Canal Company continued to run their traffic organisation, providing the pilots and arranging the shipping convoys as usual. The Navy provided the berthing organisation and moored up or cast off the ships in the right sequence and at the right times to meet the Company's requirements for the passage of the Canal. A very complete shipping intelligence organisation was kept up in the cruiser with full information of all arrivals and departures and full particulars of convoys, so that the Navy's operations could be extended without delay if the Canal Company met further difficulties.

A similar liaison with the Canal Company was maintained at Suez at the other end of the Canal, where two or more destroyers or frigates were stationed from October 19. At Suez there was not the same berthing and mooring problem, as ships lie at anchor while waiting their turn to make the passage; as at Port Said, however, there was unloading to be done and repair work to be undertaken.

The Navy was also responsible for law and order at the ports up and down the Canal, and a flotilla of armed craft—small landing-craft and warships' motor-boats—was formed to patrol the waters. Their task was to deal with any attempts at sabotage, such as the cutting of mooring wires, to protect ships' crews, Company employees and Egyptians who continued working, and to prevent theft and pilfering.

Another task was the provision of armed boarding parties to prevent disturbances in the ships or physical interference with their working. The

Egyptian police were ready to seize any opportunity that offered to cause obstruction and delay, and a show of force was necessary to keep them in check. The Egyptian customs officials did everything possible to cause delay and raise legal difficulties to hold up the sailing of the ships. They frequently altered their own regulations without warning, as in the case of the sudden imposition of a levy on all cargoes entering the Zone. As the Canal Company were not willing to move a ship until it had a customs clearance, this might have proved an effective obstruction. The difficulty was overcome, however, by the signing of promissory notes for the customs dues; these notes satisfied the Company, who then put their pilots on board to move the ships.

Another difficulty was caused by the strike of the Egyptian electricians who install and work the searchlights hired out to light ships through the Canal at night. At first this strike compelled the Company to confine convoys to daylight hours except for ships carrying their own permanent searchlights; but as more ships provided their own lights it became possible, by placing ships with lights between those without them, to run night convoys again.

The repair staffs of the warships had plenty to do, and a number of quite big emergency jobs were carried out. There was one case of a ship with two bent propeller blades; naval artificers cut away the bent portions of the propellers and the ship was able to proceed on her way at moderate speed. Defects in gyro compass gear and adjustments to radar installations were among many of the lesser jobs undertaken. The Navy provided all the fresh water, fuel, and provisions needed by the naval forces in the Canal Zone and frequently met the requirements of merchant ships short of such supplies. Doctors and medical staffs had a busy time meeting heavy demands for medical assistance and inoculations.

From the middle of October to the end of February the Navy handled 3,432 ships, over half of which were foreign. All these ships, of twenty-eight nations, required berthing and unberthing. The record number of ships berthed at Port Said in one day was sixty-five, and at the start the handling of so many ships provided many problems. The naval crews of the mooring boats lacked experience: the mooring buoys are difficult to manage and many of the "buoy-jumpers" lost their balance and fell into the water before the knack of it was acquired. There was also the language difficulty; the crews of the merchant ships either spoke no English or, if they did, often used terms and expressions which were incomprehensible to the naval men. There was much shouting and gesticulating in the early stages. With practice, however, the mooring crews became highly skilled, understanding rapidly grew between the naval men and the merchant sailors, and the work was soon being carried out with rapid and quiet efficiency.

Everything was free of charge. The Navy regarded the Canal crisis as an event which might well become an international disaster. In keeping with naval traditions, they were anxious to do their best to limit the damage and, as in the case of naval rescue work at times of flood or earthquake, they asked for no reward for goods or services. In fact, the work of the Navy saved the shipping companies considerable sums in berthing costs, and it was calculated that over one period of six weeks this amounted to a saving of some £30,000.

THE WORK OF THE ARMY AND THE AIR FORCE

Everything, of course, depended ultimately upon the British maintaining the security of the Canal Zone. The crisis showed plainly that although the uninterrupted working of the Canal is of primary importance to many nations, only the British will take action if disturbances break out which threaten the running of the Canal. A great many nations use the Canal, but when the time came it was left to the British servicemen to preserve law and order up and down the Canal, to protect the Canal Company's pilots and other employees, and to keep the traffic flowing. No other nation sent so much as a token force to help in the international task. It was 1882 over again.

The Royal Air Force played a big part in transporting the military reinforcements which were so urgently required at the outset of the emergency. Between October and December, 1951, aircraft of Transport Command and the Middle East Air Force carried 17,000 troops and airmen in connection with the crisis. About half of them were flown into the Canal Zone from other Mediterranean bases, and the remainder were flown direct from the United Kingdom to the Canal Zone and other areas. On their return flights to England they carried some 2,700 women and children of British Service families from Egypt; and during the operations the aircraft flew a total of more than a million miles without mishap.

CLIMAX OF THE DISTURBANCES

Throughout November, December, and January there were increasing numbers of incidents involving armed clashes between the British troops and Egyptian terrorists, in which a number of men were killed on both sides. The situation was particularly serious in Ismailia, where violence was facilitated by the undisciplined auxiliary police. General Erskine therefore decided to disarm the police, and on January 25 their barracks were surrounded by British forces. In the fighting which preceded the surrender of the barracks four British soldiers and forty-two Egyptian police were killed.

This incident was seized upon as the signal for an outbreak on the following day of rioting, arson, and pillage by organised Cairo mobs, whom the Cairo police made no attempt to control. Twenty Europeans were murdered, many buildings burnt down, and £20 million worth of property destroyed. It was evident that the rioters were acting on carefully prepared plans directed as much against the Palace and the rich as against the British. King Farouk, thoroughly alarmed and fearing foreign intervention, took energetic steps to restore order: martial law was declared and the situation brought under control by the Egyptian Army; Nahas Pasha was dismissed and a new government appointed under Aly Maher; numbers of Egyptian officials were arrested for failing to take action against the mobs, and steps were taken to restore discipline to the police. The Egyptians now realised that they could not gain their end by force, and though the new government maintained the demands for the departure of the British forces and for sovereignty over the Sudan, they showed willingness to resume negotiations. Anti-British violence and strikes were called off, Egyptian labour began to return to work, and on February 11 the first ship worked by Egyptians since the previous October passed



The Suez Canal, 1952. The Coldstream Guards arrive at Fayid by air

through Port Said. Gradually normal conditions returned; the Navy's task was over.

THE DEBT OWED TO BRITAIN

A great debt is owed to Britain for so promptly and effectively preventing a great calamity and to the Royal Navy for the work done for so many nations. Passenger liners, cargo liners, tramp steamers, and tankers passed through the Canal as usual, ships' timetables were uninterrupted, and no shipping company of any nation diverted its ships from the Canal route. The bulk of the traffic belonged to the principal maritime nations—the British Commonwealth, Norway, the United States, Holland, France, and Italy—but the ships of countries like Denmark, Turkey, and Spain, no less than those of Soviet Russia and Egypt itself, received the same efficient and cheerful help from the British sailors. Immense damage might have been done by the Egyptians in their violent nationalism, and the nations of the world might have suffered greatly at a time of strain for all national economies, when delays in the arrival of cargoes of food or fuel might have meant suffering and privation for thousands of people. There is no doubt that the Canal traffic would have come to a standstill, great harm would have been caused to the trade of the world, and serious financial loss suffered by many countries but for the action of the British.

A. D. NICHOLL

CHAPTER XIV

THE RESERVE FLEET. I

ORGANISATION AND PROGRESS FROM EARLY DAYS UNTIL 1939

FOR SEVERAL centuries the Navy of England lived, in the matter of its ships, a hand-to-mouth existence. Ships were built hurriedly during a war, manned by such recruits as could be obtained and brought to full complement with the press, and then, as soon as the war was over, laid up "in ordinary" and the crews discharged. This entailed the ships being stripped down to the bare hull and lower masts, "to a gantline" as the expression was, and secured to buoys in the main home ports. There, untended and uncared for, they swung endlessly to the ebb and flow of the tide, slowly rotting until the next war should bring them again to life and activity.

No one in time of peace was interested in their condition. No administration dared ask Parliament for money for their upkeep. After a year or two the rot, caused usually by rainwater which had collected in the bilges, began to accelerate and a race would develop between the outbreak of the next war and the time when the ship's bottom would fall out. Fortunately for the ship, the next war usually won, but at the cost of a high casualty rate when the ships were again at sea. The gear ashore suffered only slightly less. Guns, anchors, topmasts, and yards were stored in the open where the weather was allowed a free hand in their deterioration. Sails and cordage were under cover, but suffered equally severely from predatory pilferers and rats.

The actual state of the ships can be judged by a report made in 1685. Although it referred to specific ships, it was symptomatic of the whole of the Navy in peacetime. "The greatest part of these thirty ships," ran the report, "were let to sink into such distress, through decays contracted in their buttocks, quarters, bows, thickstuff without board, and spirkettings upon their gun decks within; their buttock-planks some of them started from their transoms, tree-nails burnt and rotted, and planks thereby become ready to drop into the water, as being (without their neighbouring timbers) in many places perished to powder, to the rendering them unable with safety to admit of being breamed* for fear of taking fire; and their whole sides more disguised by shot-boards nailed and plaisters of canvas pitched thereon (for hiding their defects and keeping them above water) than has been usually seen upon the coming in of a fleet after a battle; that several of them had been newly reported by the Navy Board itself to lie in danger of sinking at their very moorings." It was a sorry state of affairs.

The first change in this haphazard and wasteful policy of laying up in ordinary came in 1832. Rear-Admiral Sir Thomas Hardy, the senior naval lord in Sir James Graham's administration, put forward a memorandum to the First Lord in which he recommended that a given number of line-of-battleships and frigates at each of the home ports should be advanced

* To bream, to haul down and burn off weed.

to a certain stage of equipment, so that they could be brought to completion quickly in the event of any unexpected emergency. Sir James Graham approved and this was the first real step towards the formation of a properly constituted reserve fleet.

For a few years this Reserve was kept in being, though in a somewhat haphazard fashion. No one was specifically appointed at any home port to administer the ships and they would appear to have been the responsibility of the local commissioner. There was no care and maintenance party living on board, but in theory the ships were visited daily by a dockyard official who was to report any defect seen or found on board.

Two circumstances were to create a profound influence on this first rudimentary Reserve fleet. The first was the long period of peace ushered in during the Victorian era. The official somnolence of their Lordships in matters naval was not conducive to the efficient superintendence of these ships, and gradually Sir Thomas Hardy's scheme sank into something very much akin to oblivion. The ships were still there, and in a partial state of readiness, it is true, but the daily visit on board was honoured more in the breach than in the observance, so that gradually this Reserve fleet drifted back into something remarkably similar to the older days. Once more the ships were left to rot at their moorings.

The other circumstance was the changing nature of the Navy. The iron ship was pushing out the wooden wall, the steam engine was taking the place of mast and sail. By the time the war in the Crimea was over the original Reserve fleet was, in any case, quite obsolete for warlike purposes. The ships were partly taken over as accommodation hulks, prison ships, isolation hospitals, and training establishments, and the remainder sold or left to rot.

The subsequent years—up till, in fact, 1879—present a most unbalanced picture of naval progress. The new steam-driven ships had many enemies and, coming as they did in a period of profound peace, the urge to experiment was semi-officially discouraged by successive Boards of Admiralty. The reason was partly financial, dictated by an understandable reluctance to swell the Navy Estimates in a peacetime budget, and partly obstructive, by the continuing opposition of a few die-hard admirals who still lived sentimentally in the days of sail.

The result was a series of building programmes which progressed by fits and starts. The building policy was dictated almost entirely by the progress made in this new field by the navies of foreign countries, and throughout the period under review the British Navy was almost always some five to ten years behind the rest of the world in technical development. Occasionally, when the lag was becoming too apparent, a public outcry would goad the Board of Admiralty into activity, and native genius would design an outstandingly modern vessel, as often as not a little in advance of her time, but the effort was never a continuous one.

This policy inevitably had an effect on the structure and maintenance of the Reserve. The ships themselves, as they were decommissioned, were laid up in the three home ports, where they came under the control of the dockyards. Naval officers already recognised them as obsolete when compared with foreign warships and there was thus no urge to take trouble in their maintenance. Once again, to all intents and purposes, they were left to rot.

THE STEAM RESERVE

In 1880 a new class of Reserve was instituted alongside the recognised Reserve. It was known as the 1st Class Steam Reserve and was related to a system of mobilisation worked out by the newly formed Intelligence Department. New ships, after their acceptance trials, were not commissioned but were passed straight into the Steam Reserve and maintained by the dockyards in such a condition that they could be ready for sea in 48 hours. The main principle underlying the mobilisation scheme was to make each of the three home commands as far as possible entirely self-supporting both in ships and men. The whole country was divided into three areas, one for each home port. On the calling out of the Reservists, all the men from one area went to the same home port and manned, first, the Steam Reserve, which was then in theory ready for active operations, and after that the main Reserve of older ships.

The scheme was first tried in practice in 1885, and the report states that "the power of naval mobilisation was most defective." Few ships got to sea at all, and none of the older Reserve. The result was a distinct shock to the Board of Admiralty, and steps were at last taken to put the Reserve, both in ships and men, on a more satisfactory footing. Another trial mobilisation was held in 1887. This went very well and all ships were commissioned within a week. The Board, well satisfied, resumed its accustomed somnolence, disregarding a note of warning attached to the report from the Commander-in-Chief, Portsmouth, on the working of the scheme. "It must be remembered," he wrote, "that in this instance the officers of the depot ships have taken a strong personal interest in the scheme, being aware that it is novel and on its trial. So long as the executive officers will personally give the time and trouble necessary to work out the details, there will not be any difficulty with the present forms in manning all available ships in the course of 48 hours." The warning, unheeded, duly became fact. Officers, after the first two or three years, no longer "personally gave the time and trouble," and by 1891 there was evidence of neglect. This had always been the case with the Reserve of older ships, but by now it was becoming apparent also in the Steam Reserve.

This 1st Class Steam Reserve had been since its inception the responsibility of a "Captain of the Steam Reserve" at each home port, only passing under the authority of the local Commander-in-Chief when the ships were commissioned. In 1891, therefore, the Steam Reserve was placed directly under the Commander-in-Chief in an attempt to halt the deterioration, and the posts of Captain of the Steam Reserve were abolished. The theory was that "the redundant or supernumerary men under his (the C.-in-Cs.) orders can be utilised in keeping effective the ships in Reserve, and it is hoped that in the case of the vessels next for commission a certain proportion of the complement will be permanently attached to them."

At the same time the names of the Reserves were altered. The 1st Class Steam Reserve became the Fleet Reserve, organised into two divisions, A and B. In Division A were ships and torpedo-boats ready for mobilisation or immediate commissioning. Should any Division A ship require moderate repairs or alterations, she moved into Division B. The

Fleet Reserve was under the authority of the local commander-in-chief and commanded by a Captain of the Fleet Reserve in each home port.

The older Reserve now became known as the Dockyard Reserve, and was also divided into two divisions, C and D. Division C consisted of the more recent of the older vessels and any ships from Division B of the Fleet Reserve that came into the dockyard for major refit or repair. Division D consisted of the crows. The Dockyard Reserve was commanded by a Captain of Dockyard Reserve and was administered by the Admiral-Superintendent.

This was certainly a great improvement, but still a long way short of the ideal. Each ship of the Fleet Reserve had an Engineer officer, a boatswain, a gunner, and a carpenter on board whose duty it was to look after the stores. The "redundant or supernumerary men" were supposed to keep the ships clean and the machinery and armament lubricated and in working order. But often there were not enough redundant or supernumerary men to perform these duties, and once again the ships began to go back. A further disadvantage was that when the Fleet Reserve commissioned in an emergency a completely new crew came on board. It would need an appreciable time to work up to full efficiency, and during that period the ship would be of little use to the fleet.

NUCLEUS CREWS

This was the state of affairs until 1904, when Admiral Sir John Fisher joined the Board of Admiralty as First Sea Lord. Fisher's great fetish, and probably the one which did most to make his name famous, was for the Navy to be always ready for instant war. "If the trumpet give an uncertain sound, who shall prepare himself to the battle?" was his favourite text, and it led him to undertake a large-scale reorganisation of the Reserve Fleet as one of his first and most important duties. He at once put his finger on the weakness, which, of course, was the fact that the Fleet Reserve ships were dependent for upkeep on those redundant or supernumerary men. Even if they had managed to keep the machinery in working order and the ships clean, there was still the fatal weakness that mobilisation would mean drafting a full crew who would know next to nothing about the ship they manned. The time lag, therefore, between mobilisation and readiness for operational service would still be some weeks at the most optimistic forecast.

Fisher's plan was to man the Fleet Reserve with nucleus crews, which consisted of those officers and men who would be required to fight the ship, the experienced gunlayers, torpedo-men, engine-room ratings, and so on, with a captain, gunnery and torpedo lieutenants, navigating officer, paymaster, and medical officer. The "manual workers," seamen and stokers, also known as "balance crews," were drafted on mobilisation. Thus there were always on board sufficient specialists in the nucleus crew to take the ship to sea in the event of an emergency and to fight her for a short time until additional help could come from the manning depots.

This was not all. The ships in Reserve were run as fully commissioned ships and were organised into three divisions, based at each of the three home ports. Each division had a rear-admiral in charge, and the three divisions were placed under the command of a vice-admiral, who had the title Admiral in Command of the Home Fleet. The divisions

periodically went to sea under their own admirals for exercises, which were carried out to half the extent of the active fleet. On top of this new organisation, each home port was required to select two battleships and two first-class cruisers from each division as "emergency" ships, and complete crews were held ready to man any two of them. Thus, at a moment's notice, six battleships, or six cruisers, or any combination of them, could put to sea in full commission without having recourse to the depots.

The provision of nucleus crews, of course, meant a severe drain on manpower, to find which Fisher extended his activities to the second half of the Reserve, the Dockyard Reserve. Here again he swept through the ships like a breath of much-needed fresh air, bringing in a much clearer vision and purpose than had existed before.

THE MATERIAL RESERVE

It was with great difficulty that previous administrations had ever been persuaded to scrap a vessel. They had retained them all in a miser's hoard of useless junk. Fisher, realising not only their naval uselessness but also their actual danger should they be manned and sent to sea, had them divided into three classes, known familiarly as the goats, the llamas, and the sheep. The sheep, those which were past all possible use, were sold out of the Service. There were no fewer than 90 of them. The llamas, possibly useful for subsidiary purposes in wartime, and the goats, ships which were worth having their armament retained on board but did not warrant any further money spent on them, were retained as a Material Reserve. There were 37 llamas and 27 goats, and they were laid up in convenient positions at the three home ports. They had no crews, but retired officers were appointed to them as shipkeepers.

The whole scheme, as is so often the case, sounded far better in theory than it proved to be in practice. One great drawback was that no allowance was made for modernisation, and very few ships ever came in for refit or repairs. Another was that the key personnel in the nucleus crews were almost always "watch and stop on" when the ships put to sea, the remainder of the complement consisting mainly of boys under training and elderly Reservists. As a result, it was most unusual for any ship of the Reserve Fleet to spend a night at sea. But in spite of these drawbacks the scheme did not work too badly and was certainly an immense improvement on all that had gone before it.

Lord Fisher's retirement in 1910, removing as it did much of the drive behind the reorganisation of the Reserve Fleet, was the signal for a gradual slowing-down of the machine he had created. Fortunately, when the test came in 1914, there had not yet been time for the whole machine to come to a stop and the naval manœuvres of that summer gave an opportunity of testing the functioning and administration of the Reserves. They still worked, if rather rustily; and with full mobilisation ordered almost immediately after the manœuvres, there was time to get most of the ships fully commissioned and worked up before war called them to the sternest test of their existence. A few of them, naturally enough, were hardly better than deathtraps, held together by little more than the successive coats of paint on their hulls, but so great was the need of ships in 1914 that even they had a part to play. But the majority of them, both

the Home Fleet ships, which were the Fleet Reserve, and the Third Fleet ships, which was the new name given to the Material Reserve, took their place in the Grand Fleet, in the five Patrol Flotillas, or in independent squadrons further afield.

POST-WAR ORGANISATION: 1919

It had been intended when the war ended in 1918 to reconstitute the fleet on the lines laid down by Fisher in 1904, an Active fleet in home waters—now to be called the Atlantic Fleet—and a Home Fleet composed of ships in Reserve manned by nucleus crews. But considerations of economy made it necessary to go back on this intention, and the ships not required in the Active fleets were placed in Reserve or on the list of ships for disposal. Larger warships had care and maintenance parties living on board, smaller vessels sharing a care and maintenance party among groups of six or eight.

By 1919 the situation was fairly well under control. The lists of ships for disposal had grown, and those ships which it was proposed to retain had been selected. Orders were laid down that ships in Reserve were to be kept in a state of readiness which enabled them to be at sea within five days, a period altered later in the same year to fourteen days. They carried 50 per cent. of fuel on board and stores for four months. The more important ships were manned either three-fifths, two-fifths, or one-fifth of full peace complement; with the remainder, skeleton crews lived on board the larger ships, those for smaller craft, or groups of vessels, being accommodated in depot ships or ashore. The whole of the Reserve, including ships on the disposal list, was administered by a Vice-Admiral Commanding Ships in Reserve, with a rear-admiral commanding a Reserve division at Portland, which was a sea-going Reserve, and three other rear-admirals commanding the more static Reserve divisions at the home ports. At the same time a material Reserve was established in which ships were laid up and their machinery covered with a preservative.

By 1922 an even more vital need for economy brought about a reorganisation. The Reserve Fleet went back to its original three divisions at Portsmouth, The Nore, and Devonport and the three rear-admirals disappeared. The Portland division ceased to exist and the whole command went down one step in rank, the fleet being now administered by a Rear-Admiral Commanding, Reserve Fleet. Each port division was administered by the senior captain present, who became known as Senior Officer, Reserve Fleet, followed by the name of his division. At the same time restrictions were placed on sea-going exercises as a further economy measure.

By 1924 the worst of the financial crisis was past and five weeks of exercises were carried out, the ships recommissioning to full crews for the period. Only destroyers and minesweepers took part in the exercise, six flotillas of the former and five of the latter. The larger ships in Reserve were not involved and remained in harbour. On the conclusion of the exercises all ships again reduced to Reserve crews and were formed into two groups. Those ships recently refitted and those coming fresh into the Reserve Fleet were to be at fourteen days' notice for operations, while those with defects which could only be made good in a major refit were at

varying notice depending on the nature of their defects. At the same time the Reserve Fleet Command was reinstated as a vice-admiral's command.

The exercises revealed some faults in maintenance, and the onus of preparing a ship for Reserve was now placed on her last Active Service crew before she was turned over. Formerly, when a ship decommissioned, her crew left her and she was turned over straight away to a Reserve crew. While this crew was, in theory, large enough to maintain her in an efficient state, it was not large enough to bring her up to a suitable condition in which she might remain inactive over a long period without too much harm coming to her machinery and fittings. A minimum standard was laid down in Reserve Fleet Standing Orders and a system of inspection brought into force to make sure that all ships reducing to Reserve were left by their last crew in a suitable state of repair and cleanliness.

The standard laid down extended to all parts of the ship. Generally speaking, boilers were to be drained, cleaned, and limed, tanks emptied and oiled out, bilges drained and cleaned, and engines cleaned and greased. Gunnery gear, including cordite but not shells, was to be landed and the guns and firing instruments heavily greased with torpoyl. Torpedoes, depth charges, and paravanes were sent ashore, dynamos and generators cleaned and greased, searchlights unshipped and stowed below, gyro compasses and electrical firing gear stored ashore. All stores, except those required for the Reserve crew, were landed, and dormant commissioning demands were prepared for sixty days' requirements and lodged with the victualling yard. The hull, frames, double bottoms, and bilges were to be repainted where necessary, the topgallant mast sent down on deck, running rigging unrove, tallied, and stowed under cover, and the ship's boats painted, covered, and shored up under their keels. With the ship handed over in that condition, it was considered that the Reserve crew could at least maintain her and prevent any deterioration of her condition.

Halfway through the 1930's it was beginning to appear that once more the nation would have to be called to arms. The Reserve Fleet was, so far as possible, brought forward to a more immediate state of readiness by refitting those ships with the more lengthy lists of defects and by docking those whose hulls had grown excessive weed during their long laying-up period. Arrangements for mobilisation were made and orders drawn up and promulgated, while stores ashore were mustered and overhauled.

By 1939, as the danger grew, further steps had been taken. Torpedoes, ammunition, depth charges, and all stores except bedding were taken back on board, the dormant lists originally lodged with the victualling yards were made active, and those stores embarked with the exception of flour, rum, fresh provisions, and clothing. Ships were painted inside and out and everything done to make them, so far as lay within the capability of the Reserve crews on board, completely ready for quick recommissioning into active service.

These steps were taken just in time. By September of 1939 all was in readiness, and the recommissioning of the Reserve Fleet went smoothly and efficiently. It was a very different story now from that of 1914, for the steps taken during the years between the two wars had ensured that the ships were still in good condition and ready to step forward into the arduous tasks demanded of them by the war at sea.

“ SPINDRIFT ”

THE RESERVE FLEET. II

THE RESERVE FLEET TO-DAY

THE HISTORY of the Reserve Fleet since 1945 illustrates both the difficulties that have ever hampered the maintenance of Reserve warships in efficient condition, and the means by which those difficulties can be overcome. The post-war Reserve Fleet is composed of some hundreds of ships, many of them up to date with the latest weapons and equipment, in Reserve not because they are old and past their day but because there are insufficient men in the Navy in time of peace to man them. The Reserve Fleet is an essential and integral part of the wartime fleet. It could not be replaced for many years even if the highest priority and immense expenditure were allotted to warship building. It is thus obvious that the maintenance of its ships in time of peace is of the greatest importance. This task is one of great difficulty, for although it comprises some 80 per cent. of the ships of the Navy, no more than 10 per cent. of the Navy's total personnel is allocated to it. Nevertheless one of the Sea Lords of the Admiralty, after visiting one Division of the Reserve Fleet in 1951, wrote :

Some of the ships appeared to me to be far cleaner than any running ship. But what impressed me by far the most was the tremendous air of enthusiasm which was so evident amongst officers and men. The idea that it is thrilling to be in the Reserve Fleet is quite a new one to me ; and, I imagine, a new one to the Reserve Fleet.

This happy state of affairs was not achieved all at once when the Reserve Fleet was again formed on the close of the late war.

POST-WAR ORGANISATION

The ships in Reserve are divided by the Admiralty into three categories: those required to be ready for sea at short notice; those on more extended notice; and those on the sale list. Of those in the last category no more need be said; the others form the Reserve Fleet, which is now organised in six divisions, based respectively at Devonport, Portsmouth, Chatham, Sheerness, Harwich, and the Clyde. The allocation of ships between these bases is governed chiefly by manning plans and berthing facilities. Harwich, for instance, is particularly suitable for the smaller craft, while the Clyde is a good safe place for the larger and more valuable ships. Each division is commanded by a captain, who has a technical and administrative staff to help him. The whole Reserve Fleet is commanded by a vice-admiral who flies his flag in a ship of the Portsmouth Division.

The question of berthing is important. The need is for safe berths where shore lighting and power can be laid on and where the men can reach their ships without wasting time in lengthy boat trips. By using shore electric power, wear and tear on ships' machinery is saved; and by providing easily accessible berths, economy in manpower is effected; manpower is always a critical factor in the Reserve Fleet. No more than the barest skeleton complements can be allowed for ships in the higher Reserve categories, and these are calculated on a maintenance basis only. To scatter these skeleton crews round the Fleet, each living in its own ship, would be uneconomical and administratively quite unpractical. Hence

the practice is to accommodate the complement of a whole division centrally in one or more accommodation ship, from which the men go daily to their tasks, returning to the accommodation ships for meals.

RE-ESTABLISHMENT AFTER THE WAR

Although the transfer of a ship from the Active to the Reserve Fleet was supposed, when the latter was re-established after the war, to be governed by the principle, adopted in 1925, that before handing her over her Active Service crew were to carry out the whole work of putting her in a state of preservation proper to a ship in Reserve, in practice things worked out otherwise. Consequently in 1950 it had become increasingly apparent that the state of ships in Reserve left much to be desired and that in fact many of the ships were really not at the notice for sea denoted by their category. This state of affairs had come about from a variety of causes.

At the end of the war the manning situation, demobilisation, and the inexperience of officers and men in this kind of work had led to ships being payed off into Reserve without proper preparation. Bilges were neither scaled nor preserved, machinery was not refitted, defect lists were not prepared, and the stores were left in a shocking muddle. Reserve Fleet complements are calculated on a bare maintenance basis, and in practice these complements have been found insufficient to maintain efficiently a ship which has been properly preserved. They have proved totally inadequate to arrest the deterioration of a ship hurriedly thrown into Reserve without refit or preservation of any kind.

Another cause was the refitting policy. A routine existed for refitting ships of the Reserve Fleet in the Royal yards, but shortage of money and labour, and the higher priority accorded to running ships, had led the dockyards to treat Reserve Fleet ships as reservoirs of labour to be manned up or denuded of labour according to the requirements of higher priority commitments. The effect of this on the Reserve Fleet ships was disastrous. Refits dragged on and on, and the ships got dirtier and dirtier as they lay for months—sometimes extending to over a year—undergoing refits which, with the necessary priority, could have been completed in three months. Even at the end of all this the ships were rarely efficient, as important items were deferred on the grounds of shortage of money or material.

Another practice which had become all too common was that of "cannibalising" Reserve Fleet ships in the interest of running ships. Ships were robbed of important items of machinery and equipment on the plea that the article in question was not in stock in the stores or yards. The excuse was the same—the running ships had to run and there was plenty of time to procure and replace the items in question in the ship in Reserve. Such policies might be acceptable in times of tranquillity, but they were highly dangerous in times of tension when the Reserve Fleet might be called upon at any moment to mobilise and take its place in the front line.

Yet another cause was the unsatisfactory state of the stores in Reserve Fleet ships. Ships in the higher Reserve categories carry the majority of their non-perishable and non-inflammable stores on board, but at the beginning of 1951 there were still many ships—legacies from the war—whose stores had never been mustered since they had entered the Reserve. Even in those ships which had had their stores mustered and their allow-

ances revised, modifications and additions to equipment involving additional spares and stores had rendered the musters and revisions obsolete, and they all needed to be done again. The stores situation was further complicated by the need for additional storage space. To meet this situation the allowances of all types of stores had to be gone through again and pruned and a fresh stowage plan arranged. But such action was far beyond the capacity of the tiny stores staff allowed by complement.

This, then, was the position at the beginning of 1951—few ships in good condition and ready for war at the required notice, but a large number of ships with defects requiring dockyard work before they could put to sea, and with machinery and equipment inadequately preserved, and deteriorating faster than the Reserve Fleet crews could make good. This unsatisfactory state of affairs had been recognised and reported by those in authority in the Reserve Fleet during the preceding years, but it was not until 1950 that adequate steps could be taken to remedy it by increasing manpower in the Reserve Fleet, and undertaking a comprehensive dock-yard refitting programme.

The private yards were used extensively. This was all to the good, as although the standard of work was no higher in a private yard than in a Royal yard, in a private yard the Reserve ships were not constantly being delayed by higher priority work on running ships. It was also found that ships came back from these yards comparatively clean and as often as not thoroughly preserved and painted both inside and out. The increase in Reserve Fleet manpower which was authorised was substantial, and although this increase was temporary and for the specific purpose of bringing certain ships up to standard, it was none the less welcome for that.

By the end of January, 1951, the additional men had started to join the Fleet. They comprised all types, Active Service men, reservists just called up, national service men awaiting their discharge, men retained at the end of their normal engagement, pensioners, etc. The officers of the Reserve Fleet were equally diverse, but they included a high proportion of older men with no prospect of further promotion, retired officers, E.S.C. officers, a sprinkling of Reserve officers, and some retained after the expiration of their engagement. In spite of the apparent drawbacks of such a mixed collection of officers and men, they possessed the right spirit as well as a wealth of experience and were eager to tackle the job as soon as the increased manpower made it possible.

METHODS OF PRESERVATION

The greatest enemy of the Reserve Fleet, next to shortage of manpower, is damp. Many processes have been developed to protect ships and equipment from the effects of damp. The American expression "Mothballing" a ship is in frequent use in the Press and elsewhere, and this expression is often used loosely to describe two different processes—"Kooncoting" and dehumidifying.

The process of Kooncoting gunmountings, directors, radar aerials, funnel openings, etc., is employed in all ships in Reserve. The equipment to be Kooncoted is cleaned, refitted, and greased. It is then covered with a fine net, and up to eight layers of plastic are sprayed on like paint to form a water- and air-tight casing. A hole is then cut in the casing,

quantities of desiccating material called silica gel inserted, and the hole resealed. A gauge to register the humidity, which can be read through a small perspex widow, is fitted inside. Once Kooncoated, a mounting should remain dry and preserved for years, and requires only a periodical inspection of the gauge to ensure that someone has not put his foot through the plastic and let damp in. This, unfortunately, is not infrequent, but it is easily remedied by renewing the silica gel and re-sealing.

A more ambitious scheme known as dehumidification is also in general use, although it is more popular in the U.S.A., where it originated, than over here. It is not suitable for ships at short notice for sea. In this system the whole ship is sealed up and dried out. Every opening except one access door is kooncoated and drying machinery is installed on the upper deck. One of the ship's pipe systems is modified to permit air to be circulated to every compartment in the ship. The machinery is then connected to the pipe system and the air pumped over a bed of desiccating material to extract the damp, and back into the ship. After some months of running the machinery continuously, the ship is thoroughly dried out and the machinery is then run at intervals to keep the ship at the required low degree of humidity. Once the ship is dried out no further deterioration through rust occurs, irrespective of her condition when drying commenced. This system suffers from drawbacks, some of which are still under investigation. Two obvious ones are that the machinery needs permanent watchkeepers, which is a tax on manpower; and that dehumidified ships must be berthed where electric power is available from outside sources.

Special processes have also been developed for preserving the electrical equipment of ships. The Reserve Fleet has inherited a vast quantity of complicated and delicate electrical equipment without the skilled men to maintain it. It is well known that the only really satisfactory way of keeping such equipment efficient is to work it regularly. Before 1951 this was not possible, and as an alternative the radar and radio offices were hermetically sealed with desiccating material inside to absorb the moisture. Electrical instruments, machines, and generators outside the offices were coated with a form of waterproof wrapping sealed with insulating tape known as "mouldable wrappings."

NEW MAINTENANCE METHODS

Much thought and experiment have also been put into developing improved methods, preparations, and equipment for performing the more normal work of chipping, scraping, and painting. A paint spraying school is being run by the Portsmouth Division, and the majority of painting in the Fleet is mechanised. A variety of air and electrically driven chisels, hammers, and wire brushes, etc. are in use and a fleet of dumb craft carrying air and electric power plants is maintained to provide power at outlying berths. All this equipment calls for skilled maintenance and constant attention, but on balance a great saving in manpower is effected.

RECENT RECONDITIONING

With the extra men joining the fleet in appreciable numbers at the beginning of 1951 it soon became possible to undertake the reconditioning of ships as well as their maintenance; it was upon the foundation of these

creative tasks that the spirit of pride and enthusiasm grew. The different divisions of the fleet tackled the 1951 programme in different ways according to the composition of the division, the state of the ships, and local conditions. One division, with which the writer was best acquainted, may be taken as typical.

In this division there were approximately fifty ships, including a battleship, an aircraft carrier, several cruisers, a couple of depot ships, with a number of destroyers, frigates, and ocean-going minesweepers. The complement of the division amounted to about 2,000 men organised in two main subdivisions. One subdivision was accommodated in a depot ship with two destroyers as overflow ships berthed alongside her. The other subdivision was accommodated in a cruiser, also with an overflow ship alongside.

Within the subdivisions the men were organised into groups and technical departments. The groups, each under the command of an experienced lieutenant-commander, were responsible for a number of ships grouped according to classes, e.g. the frigate group, the destroyer group, etc. The group commanding officer was responsible not only for the state of his ships and the discipline, employment, and welfare of his men, but also for co-ordinating the inspections, maintenance, and preservation work of the technical departments, the Gunnery, T.A/S. and electrical departments, each of which operated under the direct control of its own specialist officer assisted by a specialist staff.

As the extra men became available the groups formed special parties, known as "Snowball parties," to undertake the reconditioning work. These parties were composed of about twenty-five seamen and twenty-five engine-room ratings. They were given the task of taking over one ship at a time and reconditioning her to a standard which would ensure that she would be in all respects ready for sea at the required notice, and a credit to the fleet. Thus, for example, the frigate group might have twenty ships in the group, all nominally at short notice for sea. Two of the worst ships would be selected and turned over to the Snowball parties for "blitzing."

First a complete survey of the ship would be carried out by the officers in charge of the party assisted by officers from the technical departments. A plan of campaign would be worked out, and approved by the group commanding officer. Target dates for completion would be fixed and arrangements made to place the ship in some convenient berth, alongside if possible, where shore lighting, electric and air power were available. The party, assisted as necessary by ratings from the technical departments, would then work systematically through the ship chipping and scraping, preserving and painting, from bilges to masthead. Only such surfaces as were passed by the shipwright officer as perfect would be left untouched. Every locker, bin, and ammunition rack would be removed, and even the ship's side lagging would be stripped in places to permit inspection of the ship's side plating.

All machinery was inspected and refitted, or if beyond the capacity of Reserve Fleet resources entered in the Dockyard Defect List. On completion the machinery was coated with a film of oil or grease as a preservative, desiccating material was placed in the boilers, and such items as packing for glands of pumps, etc., packaged and hung immediately

adjacent to the pump ready for insertion on the ship coming forward for service. Electrical equipment was similarly tested and brought up to date, but on completion the offices were not, as hitherto, sealed up, as the increase in manpower enabled the electrical department to form maintenance teams which visited each ship of the fleet weekly and tested and ran the machines, radio, and radar equipment.

The stores were a tougher proposition. Unfortunately, it was rarely possible to co-ordinate the revision of stores with the general reconditioning of a ship, as the stores took longer than the rest of the ship. The Supply Department formed a number of Stores Revision parties composed of junior supply ratings led by experienced stores petty officers or civilian inspecting officers. These parties dealt with the stores in the same systematic way as the Snowball parties dealt with the ships. They mustered the stores, brought the books up to date, revised the allowances in accordance with the latest modifications and equipment, reviewed the stowage arrangements, and if necessary replanned them. They then drew any new stores required, and returned surplus or obsolete stores, and having stowed and tallied all the stores they closed up and sealed all except the "ready use" storerooms.

The whole process of reconditioning a ship, apart from the stores, took about three months from the date of the survey to the date of the final acceptance inspection by the senior officer of the Reserve Fleet. This final inspection was a formal affair akin to an admiral's inspection. The Snowball party who had reconditioned the ship would be fallen in while the senior officer in person visited every compartment of the ship accompanied by his staff. This inspection was the culmination of a series of technical inspections by the technical staff, who satisfied themselves that the equipment was technically up to date, efficient, and properly preserved. Inspections included a scrutiny of the ship's records and papers, since it is essential that such items as watch and quarter bills, commissioning cards, navigational data book, ship's book, skeleton standing orders, defect lists, and the like are available and up to date when the ship commissions on mobilisation. After the inspection the senior officer would talk to the Snowball party, commanding or criticising their work, and would render a comprehensive report to the Flag Officer Commanding Reserve Fleet on the general state of the ship.

The men took an increasing interest in the work and the standards achieved rose steadily as groups vied with each other to produce the smartest ship and to have her chosen as the representative ship of the Reserve Fleet for Navy Week. In passing, it is noteworthy that at Portsmouth the Reserve Fleet ship ranked third as the most popular attraction to the public, coming after H.M.S. Victory and a modern aircraft carrier.

The daily routine worked in this division was dictated by the berthing arrangements and the port and dockyard routines. The hands turned to at 0800 in their accommodation ships. Special parties then went by boat or on foot to their special tasks, returning on board the living ship for meals. Although great attention was paid to the punctual operation of a regular boat routine, much valuable time was wasted, and there is little doubt that inconvenient berthing is the biggest single factor in reducing the Reserve Fleet's productivity.

The men's work was hard, dirty, and more analogous to that of a "dock-yard matey" than to that of a sailor, but it was creative work with something tangible and worth while to show for their pains. In consequence, not only the standards but the general morale of the division rose. A sense of purpose and a team spirit were fostered by periodical talks to the men on the tasks ahead and the results achieved. Each large group of men on joining was addressed by the captain, and part of the joining routine was to take them round a completed ship so that they would understand what was possible and what standards were expected. It was emphasised to them that the object was to make the ships not only efficient but also so clean and smart that the crew joining on mobilisation would get away with a flying start proud of their ship and with high morale. Visits by members of the Board of Admiralty, senior officers, and foreign visitors were frequent and did much to impress on officers and men the importance of their work. Nevertheless, morale building was not easy in a division of 2,000 men when the drafting rate averaged 500 per month.

Such ceremonies as colours, divisions, and sunset were regularly carried out with punctilious attention to traditional ceremonial. Regular inspections of ships, boats, and drifters were instituted and standards of appearance equal to that of an Active Service ship were demanded. It was made known that any lack of paint or polish must be compensated for by meticulous attention to seamanlike appearance. Ceremonial divisions and general drills took the men from their normal tasks for one afternoon a fortnight, but they undoubtedly paid a high dividend in maintaining the divisional officer's contact with his men and in providing opportunities for the exercise of those seamanlike qualities of initiative, quick thinking, and corporate action which do not normally occur in the routine work of a Reserve Fleet.

The social and sporting activities were delegated to committees presided over by selected officers who were enthusiasts for that particular form of activity. The basis of the sporting organisation was the group, and an inter-group regatta held during the summer evoked great enthusiasm. A series of fleet dances was organised ashore with the purpose of bringing the wives and families into the atmosphere of the fleet and so building a homogeneous force out of a heterogeneous collection of "bundle men." Success was also achieved by the fleet's football, hockey, and cross-country teams, and this success was attributable almost as much to the growing fleet spirit as to the prowess of the individual members of the teams.

For morale to be sound it must be securely based. So the chaplain started a programme of informal "Padre's hours," held in the men's own messes, one mess at a time. They took the form of discussion groups and became a popular event. The relevance and significance of our faith and moral standards as barriers to the spread of atheistic Communism were discussed with the officers in similar discussions in the wardroom.

The morale aspect of the Reserve Fleet life offers peculiar difficulties, since the men are denied the normal interests of seafaring and visits to foreign ports. Exceptional efforts are needed to stimulate the interest of the younger men, most of whom inevitably and rightly want to get to sea and at first resent being sent to an immobilised ship and being employed on a dockyard matey's work. These difficulties are increased by the fact

that the older men, who in a seagoing fleet provide the balance and leadership during non-working as well as working hours, in the Reserve Fleet disappear ashore to their homes at 1630 leaving the younger ratings to their own inexperienced resources. In spite of these difficulties and thanks to increased manpower, dynamic leadership from the top, and efficient direction of effort, the condition of the Reserve Fleet has been revolutionised during 1951.

Some idea of this progress can be given by quoting figures from one division. Thirteen ships of various classes from a depot ship to 'Algerine' class minesweepers were reconditioned, ten ships were brought forward from Reserve and commissioned for service. Seventeen ships were refitted, six were docked, and twelve more were in hand being reconditioned at the end of the year.

Sufficient ships have been reconditioned by the combined efforts of the Royal and private yards and the men of the Reserve Fleet to ensure that the immediate requirements on mobilisation can be met; but there is still much work to be done on the ships of the lower categories and priorities. The accomplishment of that task must depend chiefly upon the provision of adequate manpower, and it is perhaps inevitable that the allocation of men and resources to this rather humdrum task should fluctuate in the future as it often has in the past. But far-reaching plans for the more efficient utilisation of both manpower and effort are in hand; and the Reserve Fleet is in no mood to slacken its efforts or to relapse into that state of somnolence for which in the past it was too often notorious.

G. R. WAYMOUTH

CHAPTER XV

THE LOSS OF H.M. SUBMARINE "AFFRAY"

H.M.S. *Affray*, commanded by Lieutenant-Commander J. Blackburn, D.S.C., R.N., failed to surface in the English Channel when due on April 17, 1951. It was only some eight weeks later that she was even located, and there were no survivors from the seventy-five men on board.

H.M.S. *Affray* sailed from Portsmouth on the evening of April 16 with the Submarine Officers' Training Course on board, to exercise in the English Channel as part of her training programme. The Training Course, which was one of three held every year, consisted of twenty junior officers undergoing their initial submarine training. The entire course was on board. The company of the *Affray*, including the captain, consisted of four officers and forty-six men, ten of the regular crew remaining behind to make room for the Training Course. A lieutenant in charge of the Training Course, and four Royal Marine other ranks, on board for the exercises, made up the total to seventy-five.

H.M.S. *Affray* was one of sixteen "A" Class post-war submarines. She was built by Messrs. Cammell Laird, and was completed in 1946. The "A" Class are no departure from normal British submarine design. Of medium size, though the largest class of British submarine, they are propelled by diesel engines and electric motors driven from storage batteries. The class are all fitted with snorts, though not originally designed for them. The snort is the device which enables a submarine to proceed on its diesel engines while submerged at a shallow depth, air for the engines and the exhaust gases both passing through the snort tube which extends from the submarine to the surface. As has been the practice in British submarines for some twenty years, the "A" Class are fitted with Davies escape equipment to enable men to escape to the surface in the event of the submarine being unable to come to the surface in the normal manner.

Since the "A" Class had been accepted into service after the "first of class" trials they had given no cause for anxiety. The snort, which was the most revolutionary addition to equipment which was in existence during the war, had been given the most exhaustive trials in all conditions; all officers and men in the submarine service had become familiar with it, and its use had been established as a normal means of progress.

H.M.S. *Affray* had been ordered to proceed to Falmouth and to carry out a practice patrol whilst on passage. She had been ordered to report her position daily between 8.0 and 9.0 a.m., and was not expected to do so at any other times during the passage. It is reasonable to suppose that her commanding officer, who had considerable wartime experience of submarines, would have acted, as far as circumstances allowed, much as he would have in war. This would have been considered a part of the training of the young officers under instruction. It is therefore probable that it was intended to make the passage submerged; during the hours of darkness at a safe depth below the Channel shipping, propelled by the electric motor; during daylight, snorting, that is at a shallow depth and

propelled by the diesel engines, while keeping watch through the periscopes.

All that is known for certain is that after getting clear of Portsmouth and the Solent H.M.S. Affray reported that she was diving at 9.16 p.m. on April 16 south of the Isle of Wight. Nothing more was known about her until she was found by divers on June 15.

One hour after the time had elapsed when H.M.S. Affray should have surfaced and reported her position, all authorities concerned with the search for and rescue of a sunken submarine were alerted. Two hours later, as the surfacing signal had still not been received, the search was begun, under the direction of the Flag Officer, Submarines, acting for the Commander-in-Chief, Portsmouth.

First on the scene were aeroplanes and helicopters of the R.A.F., followed by destroyers, submarines, frigates, minesweepers, the deep-diving vessel Reclaim, two United States destroyers, three French small craft, and a Belgian frigate. By the evening of the 17th there were twenty-four vessels in the area, with more on the way. The search was then along a line between latitude 50° 10' N., longitude 1° 45' W. and latitude 49° 45' N., longitude 3° 20' W., which is about the centre of the English Channel from St. Albans Head to Start Point, a distance of some seventy miles. As it was considered that if there had been an accident it probably took place either when H.M.S. Affray dived or soon afterwards, an Asdic and visual search was concentrated near the position of diving, about thirty miles S.S.W. of the Needles Light.

In the absence of any indication of what had happened to H.M.S. Affray, it seemed possible that she could still be submerged, having misread or misinterpreted her orders about making a daily report of her position; that if in so doing she was carrying out a deep-diving patrol she would not be able to pick up the messages which were being made to her every quarter of an hour by Rugby W/T station. As time went on, however, the chances of the submarine having misinterpreted her instructions were becoming less, and therefore the chances of an accident were increasingly possible.

It was believed that H.M.S. Affray had enough oxygen to support the lives of the crew for three days, providing, of course, that an accident had not flooded any of the compartments and so reduced this time. There were on board, distributed throughout all compartments, enough sets of Davies escape equipment for every officer and man. This equipment consists of the Davies breathing apparatus and an immersion suit to insulate the wearer against the cold. The suit has a white light on the shoulder. The immersion suits had been issued to all submarines only after the loss of H.M.S. Truculent in the Thames in January, 1950, when many men were so tragically lost through being drowned after successfully escaping to the surface.

At about midnight on April 17-18 the submarines Trespasser and Sea Devil, working together, were the first to report vague Asdic contacts with H.M.S. Affray. Surface ships with Asdics further confirmed the position of the submarine, and the Commander-in-Chief, Portsmouth, reported: "Affray has been located on the bottom thirty-five miles southwest of St. Catherine's Point in just over thirty fathoms of water. She was located by H.M. ships assisted by U.S., French, and Belgian men-of-war, together with aircraft of Coastal Command, naval aircraft, and a

French aircraft. After the submarine had been definitely located, search vessels were disposed in the vicinity ready to rescue any men who came to the surface. Rescue operations have best chance of success in full daylight."

At daybreak small explosive charges were dropped over the position where H.M.S. Affray was believed to be lying. These signals would indicate to the crew that surface craft were ready in position to pick up any men who came to the surface. As the day wore on and there were neither survivors nor other evidence of the presence of a sunken submarine, it became increasingly likely that a mistake had been made. Some ships, however, stood by for the survivors, while others continued with the search. The total number of ships engaged in the search had by the afternoon of the 18th risen to thirty-four. Throughout the night of April 18-19 the search was continued, though the hope that survivors would be found had by then much diminished.

Hopes were again falsely raised on April 19, when a Coastal Command aircraft sighted oil patches and dropped a marker in a position ten miles south of St. Catherine's Point. Another aircraft sighted the marker and reported it as a yellow buoy which might have been H.M.S. Affray's marker buoy (a buoy on a wire which a submarine can release in an emergency to mark its position). The aircraft also reported sighting a smoke candle which might have been fired from the submarine. A force of ships was ordered to the spot, but subsequent enquiry proved conclusively that there was no buoy, and the smoke candle was the marker dropped from the aircraft.

At about the same time the diving vessel Reclaim started diving operations on a contact about thirty miles south-west of the Needles. This contact was not in a place where one of the many wrecks in the area was known to be. As the calm weather of the previous three days worsened with signs of a gale developing from the eastward, the diver could not go down and the operation was postponed. A more detailed survey of this wreck later showed it to be too long for a submarine.

On the evening of April 19, sixty-nine hours after H.M.S. Affray dived after sailing from Portsmouth, all hope of rescue was abandoned, and the character of the operation changed. The object of the search was no longer to save life but to establish the position of the submarine, to carry out a diving survey, and to find the cause of the disaster. The forces necessary for such a task were considerably smaller than those which put to sea with the primary object of saving life. The services of the Belgian, French, and U.S. ships were dispensed with, and all but a small force of British ships were dispersed to their normal duties. The force remaining consisted of three destroyers, four minesweepers, two surveying vessels, a deep-diving vessel, a salvage vessel, and a radar training ship. This force, assisted by aircraft, continued the search on the 20th in a fresh wind with rain and poor visibility. This survey of the many wrecks in the English Channel was to continue for eight weeks. The area searched was about 6,000 square miles. During that period the total number of contacts made was 150, and of these twenty-four were defined as old wrecks, thirty as probably rocks, and eight contacts were investigated by divers; the ninth proved to be H.M.S. Affray.

In the absence of any signs whatever of H.M.S. Affray since she disappeared, speculation on the cause of her loss could not lead very far. In

time of peace loss by collision is perhaps the most likely, and might have accounted for the disappearance without trace. It might have been possible for a merchant ship to have struck the submarine while she was at periscope depth without realising what had happened. If the pressure hull were holed, the submarine would have been flooded throughout in a very short time. Such an accident had occurred before. If this had been the cause a clue could possibly have been gained from a merchant ship in the Channel at the time of the loss. Enquiries were made, to no avail.

Soon after the long business of examining the wrecks in the Channel had been started, four members of the Royal Naval Scientific Service started work on the development of an underwater television camera which later proved to be of very great service. Portable television equipment similar to that used for outside broadcasting was obtained from the Marconi Wireless Telegraph Company. Having obtained this equipment, the naval scientists not only had to mount the camera in a specially welded watertight and pressure-tight container (the pressure at forty fathoms is something over 100 lb. per square inch) but had to design and incorporate the various remote controls for operating it. The container had to be set in a specially designed frame along with underwater lighting apparatus which had previously been devised to facilitate the work of underwater photography. As soon as it was completed the equipment was taken to the diving vessel H.M.S. Reclaim and lowered over the side for testing. Results proved sufficiently encouraging to warrant the use of the equipment in the actual search. After a wreck had been located by Asdics, the television was used for further investigation, and when there was uncertainty it proved of great value to the divers, particularly in helping them to be lowered into the best position for surveying or otherwise working on the wrecks.

Work started with the television camera towards the end of May. Many wrecks were examined, but it was not until June 14 that H.M.S. Affray was found, fifty-nine days after her disappearance. She was first identified by the television camera, and this was later confirmed by the visual observation of a diver. An eye-witness of this event in H.M.S. Reclaim reported as follows :

We used the television for some weeks and investigated a number of wrecks which had previously been located by Asdic and echo sounding. Then we were sent to a new contact which had also been located by Asdic. We picked it up on our own Asdic equipment, ran over it with echo sounding, and moored the ship.

After a series of disappointments on contacts which had offered good prospects, we did not dare hope for too much. The weather was not too good but did not look sufficiently threatening to interfere with operations. The ship had been moored at slack water, and owing to the tide starting to run it was necessary to wait for some hours before we could lower the television camera.

At about midday on June 14 I gave the order from my cabin to lower away and almost immediately saw the rail of the conning tower hatch coming into view on the television screen. It was only necessary for me to give a few further orders for adjustment before the name on the conning tower was seen on the screen. . . . Soon after we had sighted the submarine on the screen the diver in the observation chamber reported that he could see a dim outline of what was apparently a submarine. . . . The evidence of the television camera, however, I considered to be sufficient, and it was some time later before another diver in the observation chamber saw the name by direct vision.

H.M.S. Affray's position was 67 miles, 228° from St. Catherine's Lighthouse, that is 37 miles south-west of her reported diving position. She was in 43 fathoms of water on the edge of the Hurd Deep, with a slight list to port. Her position was considered to be in "an area of relative improbability," being well off the direct route to Falmouth. There was, however, nothing in her sailing orders to prevent this, and there was no reason why she should not have been in the position where she was found.

The depth at which H.M.S. Affray was lying presented few difficulties for divers with modern equipment given calm weather and slack tide. But the weather in mid-Channel is unreliable at any time of year, and with a fifteen-foot rise and fall diving was only possible between half an hour before and half an hour after high or low water. When the weather was unfavourable H.M.S. Reclaim had to leave the position of the wreck, as there was a risk that she might drag her anchor over it.

The preliminary observation of the whole length of the submarine indicated that she was in normal condition, except that the snort tube was damaged. All hatches were shut and her indicator buoys were housed—that is, they had not been released. Her hydroplanes were set to rise. There was no sign of any attempt having been made to make use of any of the escape hatches.

The damage to the snort was serious. The tube was broken two or three feet from the base and was lying on the port side at right angles to the hull. The hull valve, operated from within the submarine, was open, leaving a hole of about sixteen inches in diameter. The damage as first seen seemed to show that H.M.S. Affray had been in collision, the snort only having been hit. Further enquiries were therefore made of ships in the Channel on the day of the accident, but none reported having hit an obstruction.

Continued investigation by divers revealed little more. Both the snort valves, that is, the hand-operated hull valve and a quick-acting power-operated valve controlled by a lever in the engine-room, were found to be open, and the submarine was believed to be flooded throughout. No other damage, nor any other unusual feature, could be found. The snort tube itself was then brought to the surface and was carefully examined. The complete absence of any marks on it or damage to it, except where it was fractured, immediately ruled out any possibility of a collision. The cause of the fracture was found to be the lightness of the design coupled with faulty material.

It is not easy to understand how the breaking of the snort tube alone could have been the cause of the loss of a submarine and all the crew. Had the crew been at their diving stations it should have been possible for some men to have shut at least one watertight door and thus isolated themselves in a compartment from which an attempt to escape could have been made: had it been possible to shut the power-operated snort valve there should have been no disaster. But serious mishaps to submarines are more often the result of an accumulation of unforeseen events following an accident rather than the initial accident, which may not in itself be grave.

The breaking of the snort tube left a 10-inch diameter hole through the pressure hull, and this at a depth of, say, 40 feet would have caused water to flow into the submarine at the rate of three-quarters of a ton a second,

at a pressure of 20 lb. per square inch. Precisely what then followed can never be known, but it is reasonably certain that if there was not a man actually stationed at the operating lever in the engine-room who might have shut the valve at the instant the snort tube broke, no one could have shut it later. Any men in the engine-room must have been overwhelmed and the water would at once have caused serious electrical short circuits followed by explosions, fire, gases from burning metal, and perhaps total darkness. The flow of water would have increased rapidly with the pressure as the submarine sank deeper, and for all we know, the accident may have occurred at a time when the crew were not at diving stations but turned in, except for a few men on watch. It is small wonder there were no survivors.

The salvage of H.M.S. *Affray*, though difficult in such a depth of water and in such a tideway, would have been possible though probably prolonged and certainly very costly. But since the cause of the disaster had been established little was to be gained from such an operation, her scrap value being no more than about £5,000. Salvage was abandoned.

“TARQUIN”

NOTE BY EDITOR

As “*Tarquin*” remarks in the above chapter, the precise course of events, and sequence of causes, which led to the loss of H.M.S. *Affray* can never be known; even if salvage were reasonably practicable, it is highly improbable that it would add anything appreciable to the evidence already available. But there are certain possibilities, and it may be of value to readers without practical acquaintance with the working of submarines to describe one which occurs to the Editor.

One danger to which submarines, driven under water by electric power, have always been liable is an explosion in the main batteries. Lead storage batteries using an electrolyte of sulphuric acid are liable to give off a gaseous discharge, part of which—derived from electrolysis of the water which dilutes the acid in the cells—contains an explosive mixture of oxygen and hydrogen. A spark at a loose connection, by igniting this mixture, may produce an explosion, possibly of extreme violence which, by blowing off the battery covers may cause a discharge of asphyxiating gases into the working spaces of the boat, and by damaging the batteries themselves and adjacent structure may cause the rapid generation of more such gases. This danger has been recognised for many years, and precautions against it, both by special fittings designed to prevent the accumulation of pockets of gas, and by careful maintenance of the battery itself and its fittings, are a part of the normal submarine practice. That there have been so few battery explosions since the early days of submarines clearly demonstrates that the precautions have, in practice, proved fully adequate. But nothing either human or mechanical, is infallible; and in spite of well-designed mechanism and the most careful maintenance, occasional accidents cannot be ruled out altogether.

If a battery explosion of some violence occurred, it seems possible that the sudden reverse pressure, in conjunction with the fault of design and material discovered in the recovered snort, might have caused the fracture.

If so, it might well, at the same time, have disabled those men whose duty it would be, in the first case, to close the snort valve and the watertight doors. If they were not closed immediately, as "Tarquin" points out, it is quite certain that they could not be closed later.

There is nothing, beyond the negative evidence of neither marker buoys being released, nor the escape apparatus being employed, to indicate that this was the actual cause of the disaster. In the case of the loss of H.M.S. *Thetis* in Liverpool Bay in 1938, the sinking of the boat herself and the large number of lives lost were both caused not by any one accident or defect alone but by a combination of small causes, none in itself very serious, which reinforced one another or interfered with remedial action which could have minimised the evil effect of any one. It is possible that some similar chain of events may have operated in H.M.S. *Affray*.

The men who travel below the surface of the sea in submarines, like those who fly above it in aircraft, are operating machines, not nowadays intrinsically very risky by nature—indeed, the thousands of miles dived and flown without accident prove that—but in which the margin of safety, on which the power to survive accident depends, is much less than in older or more conventional craft. That they understand very well, but it does not deter them from volunteering to serve in such craft or from taking in their stride the risks that that service entails.

H. G. T.

CHAPTER XVI

BRITISH DESTROYERS

AFTER THE launch of the 'Daring' class destroyer Diamond at Clydebank on June 14, 1950, Vice-Admiral Sir Michael Denny, the Controller of the Navy, said he believed that the 'Daring' class, the most comprehensive and capable ships which human ingenuity could devise, were the last which could be recognised as fleet destroyers. In the future we should be building smaller and lighter ships specifically designed to deal with the submarine threat, instead of fleet destroyers designed for surface action by day and by night. It was quite sad to see the last of a class of ship which had lasted for about sixty years, but the Diamond was so large and complex that in earlier days she would have been classed as a light cruiser. The tendency was for the destroyer type to develop along two separate lines, the one tending towards the light cruiser type and the other towards the anti-submarine frigate. In a report of the occasion it was remarked that though the 'Darings' were the ultimate destroyers, they marked the end of a phase in warship development.

The original destroyer Daring, the third torpedo-boat-destroyer in the Royal Navy, was laid down at Messrs. Thornycroft's Chiswick yard in 1893 and commissioned on October 1, 1894: 185 feet long by 19 feet beam and 7 feet draught, she displaced about 220 tons. Her three water-tube boilers and two triple-expansion reciprocating engines developed 4,644 I.H.P., and on trials she attained 28.21 knots. She was armed with one 12-pdr. and three 6-pdr. guns and three 18-inch torpedo tubes, one of which was a fixed bow tube. Her complement, including the commander in command, sub-lieutenant, gunner, and engineer, was 45. She cost £36,468.

The present Daring, laid down by Swan Hunter at Wallsend in September, 1945, and commissioned on January 22, 1952, is 390 feet long by 43 feet beam and 12 feet mean draught, excluding propellers. Her standard tonnage is 2,610 ("Jane's" gives her full load tonnage as 3,700) and she is armed with six 4.5-inch guns in three twin turrets, three twin 40-mm. guns, two pentad 21-inch torpedo tube mountings, and an anti-submarine weapon called a Squid which throws depth charges. Her engines and boilers are arranged in self-contained units to reduce vulnerability in action, and will probably give a speed of something more than 30 knots. She has a complement of about 280 officers and men as a flotilla leader; private ships of the class have about 20 less.

The differences in the size, complexity, and power of the two ships are huge, but these differences are no greater than those between naval warfare as it was in 1894 and as it would be were war to break out today. In 1894 submarines, aircraft, wireless, radar, and even long-range gunnery were all unknown; the new weapon of those days was the torpedo, and it was to deal with torpedo-boats that destroyers were originally designed.

TORPEDO-BOATS

Torpedo-boats armed with Mr. Whitehead's new locomotive torpedo began to appear in the navies of the powers in 1877. The early boats were

neither large nor powerful—H.M.S. Lightning, the first British one, 84 feet long, 27 tons displacement, and 18 knots speed, was armed with a single 14-inch torpedo which carried 26 pounds of guncotton 600 yards at 18 knots—but each successive class was a little larger, a little more seaworthy, and a little better armed than the class before. It soon became evident that, in narrow seas, at least they might be a very real menace to a fleet or to merchant shipping, particularly in thick weather and at night.

TORPEDO GUNBOATS

Early in the 'eighties several navies began to experiment with craft designed to counter torpedo-boats. At first they tried what were called torpedo-cruisers, vessels of something over 1,000 tons; later, when manœuvres showed that these were too slow and unhandy to chase torpedo-boats with any chance of success, the smaller torpedo-gunboats were introduced. The first two of this type, which came to be called torpedo-catchers, were the French *Bombe*, of 395 tons and armed with four 47-mm. Q.F. guns and three machine guns, and the British *Rattlesnake*, of 550 tons, armed with one 4-inch B.L. and six 3-pdr. guns. Both ships were close on 200 feet long, had a maximum speed of about 18 knots, and carried two torpedoes in addition to their guns, perhaps in the hope that their task of driving off enemy torpedo-boats might lead them into positions from which they could themselves deliver torpedo attacks; or more probably for self protection if they should find themselves too close to enemy cruisers. The *Bombe* was found to be too frail for sea-going in anything but fine weather; the *Rattlesnake* was better. Neither, however, was fast enough to overhaul torpedo-boats and sink them by gunfire or ramming; for by 1885, when they were commissioned, new torpedo-boats were attaining 21 knots on trials. For the rest of the decade the Admiralty tried to produce a satisfactory class of torpedo-catcher without success. Despite greatly increased horsepower, they failed to achieve the necessary speed and they became too large and conspicuous to have any chance of using their own torpedoes at the short ranges of those days.

THE FIRST DESTROYERS

No solution appeared until 1892, when Mr. Yarrow, one of the leading torpedo-boat builders, showed his design for a craft which would be both a "snapper-up of torpedo-boats" and a first-class torpedo-boat herself to Sir John Fisher, who was then Controller of the Navy. Sir John was enthusiastic: it was the sort of idea that appealed to him. And with the agreement of the other members of the Board the order for a prototype was placed with Yarrow's yard early in 1893. It is more than probable that Mr. Yarrow was at least influenced by the German *Torpedodivisions-boote* which were used as torpedo-boat flotilla-leaders. They had first appeared in 1887, and by 1891 they were 380-ton vessels with 26 knots speed. It seems strange that with the knowledge of these vessels the Admiralty should have had to wait for a private firm to put them on the right track; but, of course, the German craft was simply a torpedo-boat-leader, whereas the torpedo-boat-destroyer was a typically British dual-purpose ship.

When H.M.S. Havock, Messrs. Yarrow's prototype, ran her trials late in October, 1893, she was so obviously successful that the Admiralty immediately ordered six more, a second from Yarrow and two each from Laird and Thornycroft.* All this first batch of T.B.Ds. carried the same armament as the Havock, but because they were all built by private firms, who were allowed considerable latitude in design, they differed slightly in details of construction, machinery, and performance. The Havock, with two locomotive boilers and two funnels, did 26.78 knots during her trials on the Maplin measured mile. The Hornet, her successor from the same yard and structurally her sister ship, had eight water-tube boilers and four funnels and achieved 27.6 knots on her trials. The Daring and Decoy, with three water-tube boilers and two funnels, the forward one fatter than the other, were also distinguished by the "Thornycroft stern," which, with its flat underwater section, became a feature of Thornycroft destroyers. The Havock, Hornet, and Daring each in turn set up a new record for speed at sea.

After the first six boats (they were always called boats in those days), the bow tube was omitted owing to the discovery that the high speed of the vessel caused her to overrun the torpedo, and two more 6-pdrs. were added. Thereafter the 27-knot boats, of which some forty-two were built between 1893 and 1896, grew slightly with each successive batch. All exceeded the designed speed on trials, but, as Mr. Fred T. Jane rather disparagingly remarked in his book, "The Torpedo in Peace and War," their service speed averaged only about 24 knots, and then only in smoother water than they generally encountered.

Lieutenant G. E. Armstrong in "Torpedoes and Torpedo-boats" has left us a description of H.M.S. Boxer, a typical 27-knotter of the 1894 programme, 200 feet long by 19 feet beam. Apart from the turtle-back forecastle, which ran for about 40 feet from the bow to the conning tower, the vessel was flush-decked. The captain was supposed to command from inside the conning tower in action, but as there was a 12-pdr. gun on top of it and a 6-pdr. just below and abaft it on either side it seems unlikely that he could ever really have done so. Even without the distraction of the too-near guns, and there was no such thing as flashless cordite in those days, his view through the scuttles would have been far too restricted for close action.

Abaft the conning tower came the funnels, in this ship two short fat ones rather far apart, with abaft them two more sided 6-pdrs. and, on the centre line, a searchlight, a twin torpedo-tube mounting, the fifth 6-pdr., and, abaft all, the emergency conning position.

Below-decks the engines, boilers, and coal bunkers occupied about 90 feet of the ship's length, while the forepeak and steering compartment took up about 20 feet more; the remaining 90 feet were available for accommodation and stores. The junior ratings, seamen, and stokers lived in two messdecks forward, each a little over 20 feet long and the full width of the ship. In the forward one under the turtle back there was reasonable headroom, but it was encumbered in the centre by the steam

* Laird and Thornycroft were provided by the Admiralty with Yarrow's drawings. This later caused trouble between Yarrow and the Admiralty, who insisted that in matters of defence national interests must come before those of firms. They won their point, but while the dispute lasted Yarrow received no contracts.

capstan engine which hung from the deck above and was apt to exude oil and steam. The after messdeck was reputed to be more comfortable at sea, but as it was scarcely 6 feet high, even between the deck beams, and contained "two large fresh-water tanks placed against the foremost bulk-head and large store cupboards against the after one," it must have been somewhat cramped. Under these messdecks there were magazines for warheads and ammunition. The boiler and engine rooms came abaft the messdecks, and abaft them again there was a small, hot, and thoroughly unpleasant little compartment containing the galley, two more fresh water tanks, and the dynamo. The latter was, of course, only required for supplying the searchlight; the ship was lit throughout by lamps and candles. Armstrong says that at sea with the galley alight and the dynamo running the water in the fresh water tanks was nearly boiling. It must have been hard to find cooks for destroyers in those days.

Between the galley and the tiller flat were the petty officers' mess, wardroom, and captain's cabin, each in its separate watertight compartment. Whether they were comfortable or not evidently depended upon one's point of view. Jane describes the captain's cabin of the Boxer as "a small hole full of corners just big enough to swing round the proverbial cat." Armstrong says of the same cabin that "the chief drawback to the comfort of this place is its proximity to the propellers; otherwise, it is very comfortable indeed. On the one side is a full-sized sleeping berth, and on the other a basin and a chest of drawers." But, then, Armstrong, in writing of the wardroom wash-place, says that "the advantage of having a comfortable bath-place down below and clear of the living cabin is a luxury which can only be fully appreciated by those who have experienced the dirt and discomfort of a torpedo-boat." Early destroyer crews cannot have been soft.

THE 30-KNOTTERS

The 30-knotters, which followed the 27-knotters from 1896 to 1903, were larger vessels with more power, better sea-keeping qualities, and a greater range. Although the armament was the same as that of the 27-knotters, they carried larger crews and, apparently, afforded them a little more comfort than the earlier boats. Later 30-knotters had electric light in the engine- and boiler-rooms, a great convenience it was thought.

The first two destroyers—indeed the first warships anywhere—to have turbine engines were the Viper and Cobra, completed in 1899 and 1900. The Viper, with 10,000 horsepower driving the same hull as the ordinary 30-knotters of her day, reached 36.5 knots on trials; the Cobra made 35.6. Unfortunately, both craft were lost very early in their careers. On August 3, 1901, after barely two months in commission, the Viper ran aground on Burhow Island near Alderney during manœuvres. The Cobra, built as a speculation by Armstrong at Elswick and bought by the Admiralty before completion because she was turbine-engined, broke in half and sank near the Outer Dowsing on September 18, 1901, while on passage from the contractor's yard to Portsmouth. She had been undergoing trials for several months, but this was her first real sea passage, and the sea was fairly rough. The court martial which enquired into the loss found that although the Cobra had been strengthened under Admiralty

supervision she was weaker than other destroyers. That the two ships were turbine-driven had no bearing on the accidents, but their loss before the engines had been fully proved on service was something of a setback.

THE RIVER CLASS

The loss of the *Cobra*, and weather damage to other destroyers about the same time, undoubtedly influenced the Admiralty specifications for the 'River' class, in which high smooth-water speed was sacrificed for the sake of strength, seaworthiness, and habitability. These ships had high forecastle decks in place of the old turtle backs, and proper bridges in place of the old conning towers; they were 225 feet long, about 550 tons displacement, had coal-fired boilers and reciprocating engines producing 7,000 horsepower, which gave them 25.5 knots on trials and 24 knots on service, and they were armed with four 12-pdr. guns and two pairs of 18-inch torpedo tubes.

The 'Rivers' marked a stage in British destroyer development, for the high forecastle which was introduced with them has become a caste mark of the British destroyer type. They were also the last to have reciprocating engines. Between 1903 and 1905 34 of them were built.

THE TRIBALS

In their way the 'River' class were a success, but evidently it was felt that too great a reduction in speed had been made and the "ocean-going" destroyers of the 1906-07 programme, the 'Tribal' class, had designed speeds of from 33 to 35 knots. These turbine-engined and oil-fired ships, 250 feet long and of about 800 tons displacement, were armed with three 12-pdrs. and two pairs of tubes. This was one gun less than the 'Rivers,' but it was a better armament because whereas two of the guns had been sided in the 'Rivers,' the 'Tribals' had all three on the centre line. Three of the 'River's' four guns had been lighter than the other; in the 'Tribals' all guns were of the heavier calibre.

Also included in the same programme were two rather larger 'Tribals,' the *Amazon* and *Saracen*, which were each armed with two 4-inch guns; their significance is obscure because the ships of the 1907-08 programme were the same as the main run of the 1906-07 batch.*

H.M.S. SWIFT

In 1909 H.M.S. *Swift*, an experimental large destroyer which had been laid down in 1907, joined the fleet. She was a ship of 1,800 tons armed with four 4-inch guns and a pair of torpedo tubes. On trials her 30,000 horsepower gave her 35.25 knots. It has been hoped that she would attain 36 knots, but in other respects she seems to have fulfilled expectations. She had, however, been expensive to build (she had cost £240,000 compared with the £140,000 price of a 'Tribal'), and though the writer in the 1910 "Brassey," was a bad prophet when he said that "she represents a type which is most unlikely to be repeated," he did correctly report informed opinion of that date.

* In the 1906-07 programme there was a batch of 225-ton craft which were styled "coastal destroyers." They were soon reclassified as torpedo-boats, and have been disregarded in this chapter.

FURTHER PRE-1914 DEVELOPMENTS

Apart from the glimpse of the future offered by *Swift*, the significant developments between 1906 and the 1914 war were the final abandonment of coal as fuel, after a last revival in the 27-knot 'Beagle' class of the 1908-09 programme; the introduction of 21-inch torpedoes, in the 1909-10 programme; and the steady trend away from the 12-pdr. gun towards the heavier 4-inch.

By the beginning of the 1914 war the 'L' class, the newest in service, were 260 feet long, 27 feet beam, and rather over 800 tons displacement. They had a complement of 73, were armed with three 4-inch guns, two pairs of 21-inch torpedo tubes, a 2-pdr. pom-pom, and a searchlight; with 24,500 horsepower, their designed speed was 35 knots. The 'M' class, under construction when the war broke out, were slightly larger and had rather more power, but their armament and general characteristics were the same as the 'L's.'

THE 1914-18 WAR

At the start of the war there were no convoys; even the transports taking the Expeditionary Force to France were unescorted and sailed singly, by night, under the protection of distant patrols sealing both ends of the Channel. Later, of course, all troop transports were convoyed, and after April 1917 there was a complete convoy system; but for the first two-and-a-half years of the war there were no convoys, and the destroyers which might have been escorting them were mainly employed with the Grand Fleet or with the Dover and Harwich Forces which swept and patrolled the Narrow Seas.

Fleet destroyer flotillas had begun practising massed torpedo attacks in 1911; in the Grand Fleet Battle Orders they were enjoined to make early torpedo attacks on the enemy's battle fleet and to counter and prevent the efforts of enemy flotillas to reach a torpedo firing position. Until the fleet actually deployed, however, destroyers were kept to screen the heavy ships from enemy submarines. This they did by plain physical obstruction and by making it dangerous for the submarines to show their periscopes, for there were no detecting devices which could be used under way. For their screening role the destroyers with the fleet needed endurance and seaworthiness; in battle their torpedo armament was of first importance, for there were cruisers and the battleship's secondary armaments to help keep the enemy flotillas at a distance.

The Harwich and Dover flotillas worked under very different conditions. In the narrow seas, where they often operated at night and in low visibility, the larger ships rarely ventured and destroyers were the ships of the line. For their work they needed speed and gun-power most; but they needed torpedoes too, because in the fleeting opportunity of a night foray the torpedo might be decisive.

Thus both the fleet and the narrow seas had definite requirements which the designers and technicians could try to meet; anti-submarine warfare was still too undeveloped to have any marked influence on design, though, of course, when depth charges came into service all destroyers were fitted to drop and throw them. On the whole it was found that the pre-war destroyer designs were sound and that no great changes were necessary. Some ships were fitted for minesweeping ahead of the fleet, some for mine-

laying in enemy waters, and some with the Burney anti-submarine sweep; but these were special fittings which did not alter the ship's main characteristics and in no way affected the basic design.

Most of the destroyers built for the Royal Navy during the war were simply improvements on the basic 'M' class design; vessels of about 1,000 tons with three 4-inch guns, four torpedo tubes, a 2-pdr. pom-pom, a searchlight, and a speed of somewhere about 33 to 36 knots.

As a result of war experience some of the 'M' class and of the 1915 'R' class were fitted with an additional 14-inch torpedo tube each side at the break of the forecastle; the modified 'R' class, ordered in March, 1916, had guns which could elevate to 30 degrees instead of 20 degrees, and this gave them a maximum range of 12,000 yards; with the 1917 'S' class the ram stem and doublings were omitted for the first time and director firing, of a rather rudimentary kind, was introduced. Primarily, of course, all these destroyers were intended for fleet work, though to begin with many of them were employed in the Narrow Seas flotillas and towards the end many were diverted to convoy escort.

The main destroyer development of the war seems to have come about almost by mistake. In 1916 it was reported that the German torpedo-boats operating in the southern North Sea were being more heavily armed and that destroyers with greater gun-power than the 'R's would be needed to cope with them. The designs for the 'V' class of flotilla leaders were available, so to save time a class of destroyers was built to them, with modifications to the bridges and accommodation only. The resulting 'V' class destroyers were 310-foot ships of 1,300 tons, armed with four 4-inch guns, a 3-inch anti-aircraft gun, and two pairs of tubes; larger, in fact, than any we had yet built, except the *Swift*.

Experience soon showed that although their larger size made them a little less suitable than the 'R's for torpedo attacks, it not only made them better gun vessels for Harwich and Dover work but made them more useful as fleet screening vessels and convoy escorts. So even when it was found that the more heavily armed German torpedo-boats were neither as numerous nor as formidable as had been feared, the new type was repeated and, of course, improved. Thus the eighteen ships of the first 'W' class, the repeat 'V's, had six torpedoes in two triple mountings, and the repeat 'W's were equipped with 4.7-inch guns.

During the war, and in the years immediately after it, 294 destroyers and 35 flotilla leaders were built, or otherwise acquired, for the Royal Navy, which, despite the loss of 65 destroyers and leaders of all ages, finished the war with a very considerable flotilla. In 1921, when the last of the war programme were completed, there were 16 4.7-inch 'W's, 55 1916 'V's and 'W's, 69 1917 'S' class, and 12 modern leaders. The leaders, which at first seemed likely to develop into a separate type, were by this time only made larger than the destroyers they led to make room for the Captain (D), his staff, and his communications. Because the ships had to be larger they were given an extra gun between the funnels, but in other respects they were normal destroyers.

EARLY POST-WAR YEARS

After the war-time building programme, or that part of it which had not been cancelled, was completed there was no further destroyer development,

or even building, until the experimental ships *Amazon* and *Ambuscade* were ordered from Thornycroft and Yarrow in 1924. Although of almost the same dimensions as the 'V' and 'W' classes, these two were a great advance on them in almost every way. In particular, they had all-steel bridges, instead of the old stanchion and canvas type, improved gunnery control, greater freeboard, better accommodation (which finally removed destroyers from the "hard-lying money" class of ship), and the use of superheated steam gave them much greater endurance. Both were completed in September, 1926, and each cost about £326,000.

THE 'A' TO 'I' CLASSES

With the 1927 programme the Admiralty embarked on a long-term destroyer-building programme, to replace the ageing war-built ships at the rate of a flotilla, of a leader and eight destroyers, each year. In accordance with this programme the nine leaders and sixty-eight destroyers of the 'A' to 'I' classes were built between 1928 and 1937. There should have been seventy-two destroyers, but four 'C' class of the 1929 programme were cancelled for economic and political reasons.

Structurally the whole series were very similar. The tonnage of all destroyers, and three of the leaders which differed only in internal arrangement from their destroyers, was around 1,350 (the other leaders were about 150 to 200 tons larger and carried the extra gun). In armament there was a slow but steady progress. With the 'A' class, quadruple torpedo-tube mountings, giving eight tubes per ship, and Q.F. guns in greatly improved shields were introduced; director towers and better fire-control equipment came in with the 'C' class; the guns of the 'E' and later classes had 40 degrees elevation; while one 'G' and the 'I' class carried ten torpedoes in two pentad mountings. The greatest advance, however, was in the anti-submarine equipment. Asdics had come into service in the late 'twenties and had been fitted to the older ships, but they were built into the 'A' to 'I' destroyers, and these ships were, for their date, excellent anti-submarine craft.

Oddly enough, no advance was made in providing an anti-aircraft armament; indeed, it almost retrogressed. During the 1914-18 war destroyers had been equipped with either a 3-inch gun or one or two 2-pdr. pom-poms; they were not very effective, but then neither were the aircraft. The 'A' and 'B' classes had a pair of pom-poms, mounted one on each side; the 'C' and 'D' classes had a 3-inch between the funnels with rudimentary control and a deplorably small arc of fire; the 'E' and later classes were provided only with a pair of four-barrelled Vickers 0.5-inch machine guns—excellent guns, but needing a disproportionate amount of maintenance and inadequate to their purpose.

All these ships were undoubtedly designed for the complementary tasks of torpedo attack on an enemy battle fleet and of protecting our own from enemy torpedo craft and submarines. That day attacks by massed flotillas were becoming unlikely was an idea beginning to be mooted, but that anti-aircraft gunnery was becoming at least as important as anti-ship was not then realised. It is easy to be wise after the event and, with the benefit of comparatively recent war experience, to blame the Naval Staff of the late 'twenties and early 'thirties for this state of affairs; but in fact

it is hardly surprising that it should have been so. Peace-time exercises could not be realistic, for safety reasons, and there was no real evidence to support the frequent assertions that bombers were better than battleships. Indeed, such evidence as there was almost pointed the other way. Even as late as 1939 the efforts of bombers against the controlled target ship Centurion were unimpressive, and until that year the Navy's only offensive aircraft was quite remarkably slow and had to drop its torpedo from what seemed suicidally short range. Despite these difficulties, it is clear that by 1935, or at the latest 1936, the Admiralty had at least ceased to be complacent about air attack, though they may not have realised the full implications of the air war. After that date all destroyers designed in peacetime were provided with as good an anti-aircraft armament as was technically possible at the time.

THE 'TRIBALS'

In 1935, the year in which the 'I' class of conventional destroyers were ordered, a supplementary building programme provided for eight ships of the new 'Tribal' class. It was the impression at the time that they were intended as a reply to the large flotilla-leader types being produced for the Continental navies, and though there is no conclusive evidence available this seems very likely.

With a standard tonnage of 1,870, they were 355 feet long by 36 feet beam, and on this they carried four power-operated 4·7-inch twins, a four-barrelled pom-pom, and four torpedo tubes. Although their gun elevation was still limited to 40 degrees, they had a complete anti-aircraft control system as well as the normal surface one. Three boilers gave them 44,000 horsepower and their designed speed was 36·5 knots. Their complement was 190 officers and men. With their emphasis on guns rather than torpedoes, they were quite unlike any earlier British destroyers and were really more of the small cruiser type.

THE 'J' TYPES

In 1936, when the second flotilla of 'Tribals' was ordered, there was a partial return towards a more normal destroyer type with the 'J' class of eight ships. They were a little smaller than the 'Tribals' and displaced about 200 tons less, largely because it was found possible to get the required 40,000 horsepower from two boilers instead of three; for this reason, too, they had only one funnel. On 1,690 tons they carried six 4·7-inch guns, in power-worked twin mountings, ten torpedoes in two pentad mountings, and a four-barrelled pom-pom. In other respects they were a compromise between the 'Tribals' and the earlier types.

The 'K' class, of the 1937 programme, were a repeat of the 'J's, and so were the 'N' class, ordered in 1938. Between the 'K' and 'N' classes, however, came the two flotillas, each of six ships, of the 'L' and 'M' classes, which were, in effect, an improved and enlarged version of the 'J's. Of 1,920 tons, these ships carried their six 'heavy' 4·7-inch guns in three fully enclosed turrets, but they carried only eight torpedoes, probably to offset the extra weight of the gun-houses. The war intervened before they were completed, and owing to the need to bring them

into service as quickly as possible some were equipped with four 4-inch twin mountings in place of the more complicated 4·7-inch turrets.

WORLD WAR II

When the war broke out the 'L,' 'M,' and 'N' classes had been ordered, but they were too complicated and expensive in skilled workmanship for rapid production at a time when the immediate need was for large numbers of adequate destroyers rather than for a few first-class ones. To meet this need 112 destroyers of the 'O' and 'P,' 'Q' to 'Z,' and 'C' classes were built during the war.

The 'O' and 'P' group were of 1,540 tons, the rest of 1,710. Mechanically and in hull form they were on the lines of the 'J' type, but their armament was more like that of the 'A' to 'I' classes. Generally they had four main-armament guns, eight torpedo tubes, an assortment of anti-aircraft weapons, and, of course, depth charges; but there were considerable variations in detail. The 'O's and 'P's had 4-inch guns and a rangefinder-director primarily designed for anti-aircraft fire; the 'Q's to 'V's had 4·7-inch guns limited to 40 degrees elevation and two director systems like the 'J' and 'Tribal' types; the 'W's had the same guns as the 'V's with a dual-purpose director; the 'Z's and 'CA's had genuinely dual-purpose 4·5-inch guns, and the three final 'C' classes, the 'CH,' 'CO,' and 'CR' flotillas, had power-worked 4·5-inch guns with a greatly improved but much heavier director and control system. To compensate for the extra weight of the guns and their control these later 'C' classes had only one set of torpedo tubes.

The need for a very much greater anti-aircraft armament was one of the first lessons learnt in the war, and in the early days all sorts of expedients were adopted. Single 2-pdr. pom-poms, 20-mm. Oerlikon guns, 40-mm. Bofors, captured Italian Bredas, and even ancient 3-inch and 4-inch guns were fitted wherever space and weight allowed. Older destroyers, and new ones, too, in areas where air attack was more probable than surface action, surrendered a set of torpedo tubes to make room for anti-aircraft guns, and some 'Tribals' exchanged their after superimposed 4·7-inch mounting for a 4-inch A.A. twin. Later, as we steadily regained command of the air in European waters, these *ad hoc* arrangements became less necessary, and most ships had their tubes replaced; by then, too, the better equipped ships were beginning to appear.

Another lesson of the war was that officers and men must live as near as possible to their action stations. This might seem self-evident, but for nearly fifty years the officers in destroyers had lived aft and the ratings forward, and it is not recorded that the arrangement was found inconvenient during the 1914-18 war. Air warfare changed this, however, and in the 'R' and later classes both officers and men were spread between forward and aft. The wardroom, captain's quarters, some officers' cabins, and about two-thirds of the ship's company's messes were forward and the rest were aft; oddly enough, this was much the same arrangement as in the old "torpedo-catchers."

Once the war emergency building programme was well under way the designers were able to turn their attention once more to the problem of producing better destroyers as well as more of them.

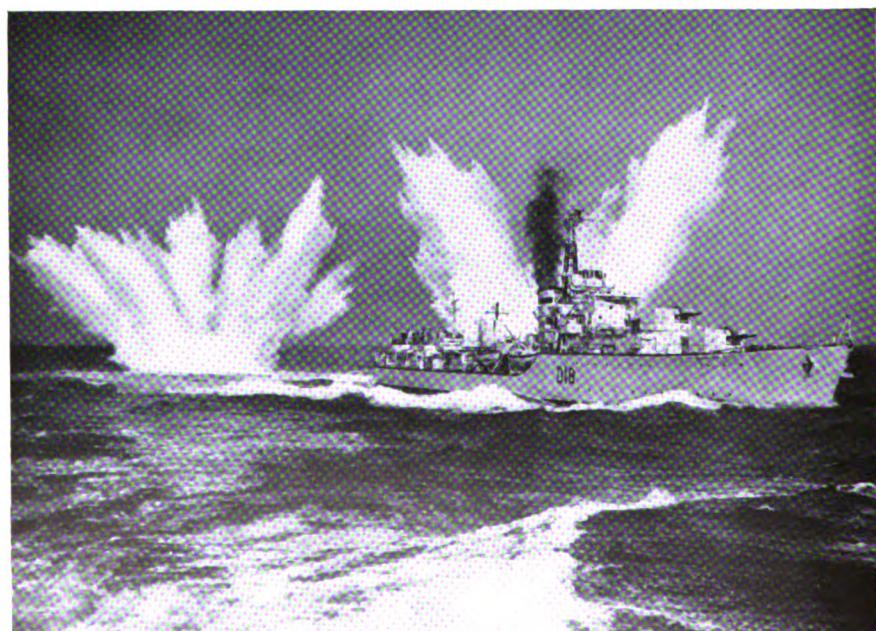
THE 'BATTLE' CLASS

One result of the designers' efforts was the improved gun armament in the later emergency ships, culminating with the power-worked single 4·5-inch and more effective director systems of the later 'C's; the other was the 'Battle' class, which were intended, it is said, for the war in the Pacific. Unlike the 'C's, which were simply improved "emergencies," the 'Battles' are a new design: 379 feet overall by 40 feet beam, their standard tonnage is 2,315 and, according to *Jane's Fighting Ships*, they displace 3,250 tons at full load. Two boilers give them 50,000 horsepower and on trial most made more than 32 knots. The two pentad torpedo-tube mountings and the depth-charge armament are conventional, but the gun armament, with the long-range 4·5-inch guns concentrated forward and the close-range 40-mm. Bofors mainly aft, is most unusual. Before the bridge there are two 4·5-inch twin turrets, modified versions of the type used in aircraft carriers, which are controlled from a large director. Abaft the funnel the earlier ships have a 4-inch "Starshell" gun, and the later ones a single 4·5-inch controlled by the director, but these guns have a poor arc of fire and contribute little to the ship's gun-power; the emphasis at this end of the ship is all on 40-mm. Bofors. Here again there is a difference between the earlier and the later ships: the former have four Hazemeyer twin mountings, two on the midship superstructure and two more on the after one, while the latter have a more modern twin on each platform, but only two of them. The reason for this curious arrangement of guns is not clear, for though it might have been an excellent one for coping with Japanese suicide aircraft, the ships were designed before anything of that kind had appeared; probably it was chosen for the sake of simplicity.

Whether the type would have been successful in the Pacific war we do not know, because only one of them arrived out there in time and she had little chance to prove herself. Two ships of the first batch were fitted with fin stabilisers, but though they were effective they reduced the ship's endurance by occupying space which would have been used for fuel, and it seems unlikely that they will be generally adopted.

POST-WAR

In 1947 and 1948 four 'Weapon' class destroyers, ordered in 1944, came into service as fleet anti-submarine destroyers. These ships of only just under 2,000 tons standard displacement are armed with four 4-inch guns in twin mountings, two pentad torpedo-tube mountings, six Bofors 40-mm., and two Squid anti-submarine weapons. They look odd to those used to the older types because, to suit the arrangement of their boiler and engine rooms in units, the forward funnel is enclosed by the lattice mast and the other is a rather insignificant stump well aft. They are large ships for their work, but perhaps they are the first to meet all the requirements of those Grand Fleet officers of more than thirty years ago who wanted destroyers with endurance, seaworthiness, and torpedo armament, plus, of course, the most modern means of detecting and destroying submarines. They are, in fact, the first true fleet-screening destroyers, but to attain efficiency in this much of the old versatility has had to be sacrificed, and for their size they are lightly gunned.



Above. Newest British Destroyer. H.M.S. Daring

Below. Anti-submarine Operations. H.M.S. St. Kitts dropping depth charges

(Official photographs by permission of the Admiralty)

Early this year the first two of the new 'Daring' class were accepted, and the rest should follow during the next twelve months. They have the same engine and boiler arrangements and the same odd-looking funnels as the 'Weapons,' but otherwise they are a development of the 'L' and 'Battle' classes; the final stage in the evolution of the heavily gunned destroyers which were advocated for the Harwich and Dover flotillas in World War I.

Introduced in peacetime to counter the small surface torpedo-boats of the nineties, the destroyer type soon superseded its prey almost completely, and by 1914 destroyers with the fleet were charged with the duties of both attacking the enemy battle fleet with torpedoes and preventing enemy torpedo craft from attacking our own. Very early in the 1914-18 war the danger from submarines made it necessary for destroyers with the fleet to be employed screening battleships and cruisers, and the desirability of a specialised type of destroyer for fleet work became evident. This requirement was met, at least in part, by the 'R' and 'S' classes which were developed from the type being built when the war began. As the main requirement was for greater endurance and better sea-keeping qualities, the tendency was towards an increase in size without any significant increase in armament. Meanwhile, in the narrow seas the Harwich and Dover flotillas found that for their form of warfare they needed heavier gun-power than the standard destroyers, and the 'V' class was evolved to meet their needs.

After the 1914-18 war the more powerful 'V' and 'W' class ships were adopted as the standard type, and in due course they were succeeded by the essentially similar 'A' to 'I' classes built in the late twenties and early thirties. In the late thirties two separate types again appeared, the 'Tribals,' a heavily gunned type built in reply to foreign competition, as the 'V's had been before them, and the 'J' type, which were general-purpose ships.

During the 1939-45 war the 'O' to 'Z' and 'C' classes were—in effect, though perhaps not by intention—the successors of the World War I 'R's and 'S's, while the 'L' to 'N' and 'Battle' classes were the modern equivalents of the 'V's and 'W's when they were new.

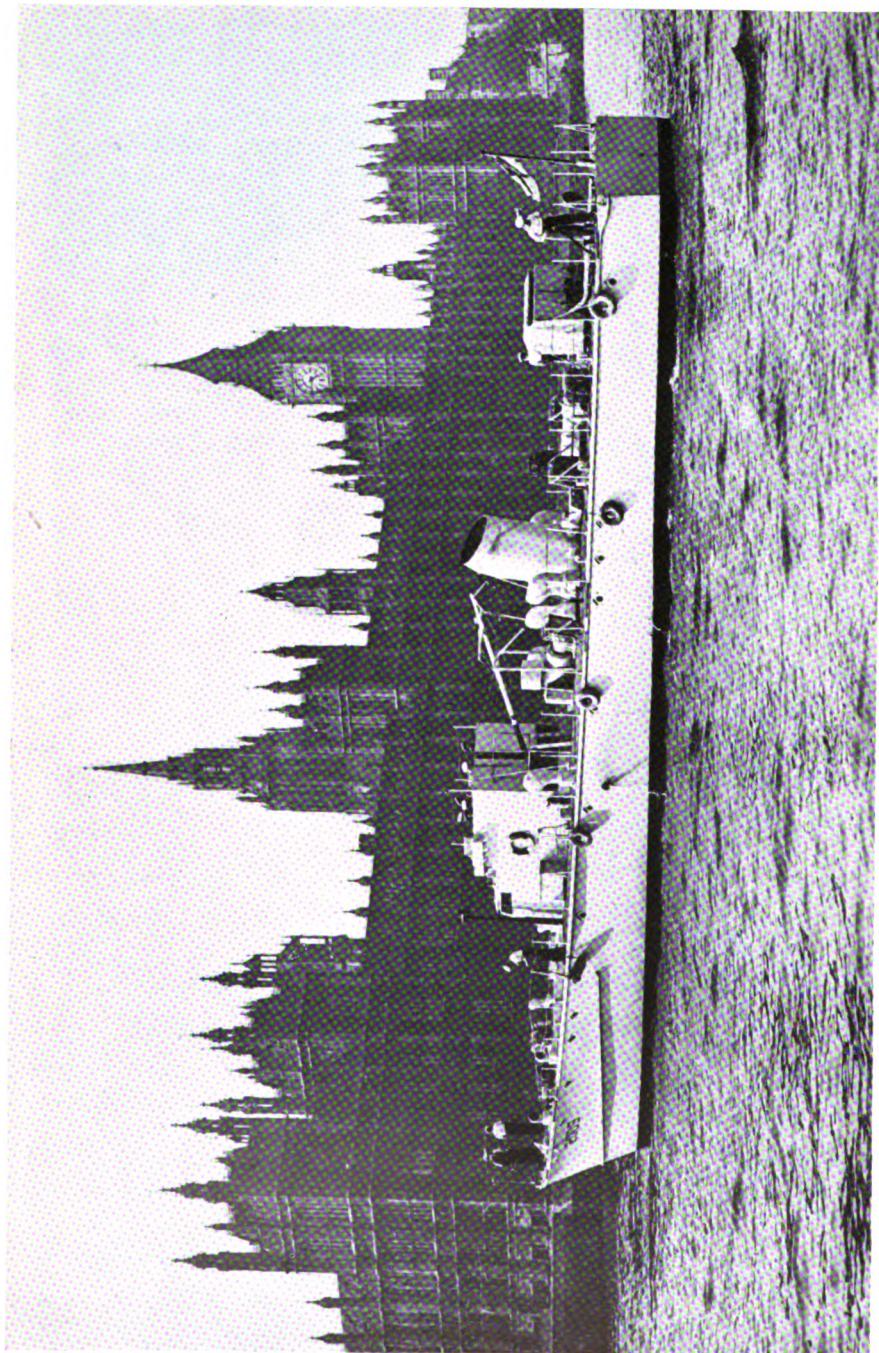
Now, with the 'Weapon' and 'Daring' classes, we have distinct separate types of specialised fleet-screening and heavy general-purpose destroyers. Both types are so large that our forebears would have thought them useless as torpedo craft, even before radar made unobserved approach almost impossible; but even with this great increase in size, which makes them more tempting targets for the submarines which should be their prey and for aircraft, there is not room to fit all the equipment the experts would like.

It seems clear that the general-purpose fleet destroyer has been developed to its ultimate form and that we can no longer expect to combine in one ship of the destroyer type all the qualities required in modern war. Versatility is very desirable, particularly in smaller warships, of which we never have enough, but it is not worth achieving at the expense of efficiency in a vital task. The trend is towards specialisation, and it began before World War II. In the late thirties the Admiralty started to develop vessels of the destroyer family which, though slower and less versatile than the true destroyers, were better suited to their own limited tasks;

the 'Pelican' and 'Black Swan' types of frigate, the 'Hunts' and the 'W' class conversions, all designed for different types of escort work, were examples of this policy, and during the war large numbers of very successful anti-submarine craft were built specifically for the Atlantic battle. Since then war-built destroyers have been converted into fast anti-submarine frigates, and in the First Lord's speech this year we were told about new types of frigates being built for anti-submarine work, for the anti-aircraft defence of convoys, and for aircraft direction.

It seems likely that in a comparatively few years there will be specialised types of frigate for all defensive tasks, including the screening of aircraft carriers, which need their screen even when there is a surface gun action in progress. Destroyers were originally introduced to defend the battle fleet; logically they should disappear if their defensive duties are taken from them, but it is just as likely that when they are relieved of their responsibilities for defending the fleet they will shed some of the defensive equipment, such as Squids, and specialise in offensive operations, probably by night. If this happens they will have fulfilled Sir Michael Denny's forecast and become light cruisers; but whether they retain the name or not they will still be the lineal descendants of Mr. Yarrow's Havock.

"EBORACUS"



Parliament and the Armed Forces

CHAPTER XVII

STATESMEN AND THE ARMED FORCES

PART I

RELATIONS IN PEACETIME

THE general attitude of a nation towards its sailors, soldiers, and airmen must form the necessary background against which the relations of statesmen to the armed forces can be seen in the right perspective.

In this country the Royal Navy has always enjoyed a great measure of popularity. This is only to be expected in an island, for its safety has depended almost entirely on holding command of the seas that surround it. It is true that the security which the sea gives to any island has diminished during recent years, but sea power is still of vital importance to us. Our very existence, moreover, depends on adequate protection of the sea routes along which are brought food and raw materials and which carry our exports all over the world. Until the advent of air travel the sea has been the only means of communication with the Dominions and Colonies, and without command of the sea it would have been impossible to concentrate the armies of the Commonwealth for joint action. The Navy has never failed in the performance of these vital tasks and has deservedly won the trust and admiration of the nation. A seafaring people is able to appreciate its naval history and to enjoy the romance and epics which enrich it: this romance forms also a vivid background to the stories of its great admirals, whether they are Nelsons or Rodneys, Drakes or Frobishers. Even the unpopularity of the methods adopted by press gangs never permanently affected the feelings of those to whom, at the time, the necessity seemed patent. Armchair critics have seldom felt in a position to suggest how fleets might have been better handled and have, therefore, reserved their more pungent criticisms for generals rather than for admirals.

The average civilian still regards those who can fly aeroplanes with respect and even some awe. This feeling will gradually fade, but the art of handling air forces is so new and so completely beyond the understanding of the general public that the R.A.F. and its leaders have been almost immune from criticism. The prestige so deservedly acquired as the result of the Battle of Britain has made such a deep impression on public opinion that it will long remain a dominating factor in the good feeling of civilians towards the R.A.F. Even before the development of the atom bomb the relative value of air power to sea power was steadily increasing: to-day it is incontestable that attack from the air constitutes a greater menace to us than attack from the sea.

The high favour in which the people of Britain regard their Navy and the R.A.F. must influence any statesmen in his first direct dealings with these two Services and with their senior officers.

The history of Continental nations, in contrast, shows how much they have had to depend for security on their armies. It is only to be expected, therefore, that criticism of soldiers should have been restrained. At the

same time, in every country there must always be danger from the power latent in an army, unless it is certain that this power can be kept under strict control. In almost every country at one time or another the Army has broken free from the bonds of civilian control: nearly every revolution has depended for success on the support which it has received from soldiers. The people cannot forget this, nor can they be expected to be entirely well disposed towards a force which they have some reason to fear. It is patent to everyone that neither navies nor air forces can constitute a similar threat. The more democratic a nation becomes, the stronger is the desire to keep subservient any power which might conceivably dispute the will of the people.

Those responsible for drafting the American Constitution fully appreciated the danger of the army getting out of control and took every possible safeguard against such an eventuality. Similarly, every other nation has felt it necessary, sooner or later, to legislate in some degree as an insurance lest its Army be tempted to misuse its great power.

In this country the roots of suspicion and distrust of its Army have been deeply planted over a period of many years. In the Civil War not only were the high-handed actions of Cromwell's Major-Generals deeply resented, but the forced levies of money by Charles I, who was unable to obtain from Parliament the cash to pay his soldiers, added as much to the bitterness of feeling.

As the power of the workers has developed throughout the world, there has been the ever-present fear that the right to strike, in order to attain their ends, could be frustrated by the Army. They cannot forget that soldiers, sometimes under the guise of keeping order, have in fact been used for strike breaking. A more legitimate use of the Army has been to ensure the maintenance of the essential services. No doubt the majority of workers have appreciated that these services must be kept going in the general interest, but some feeling of irritation is inevitable against those who have to be used for the purpose. It is true that naval and air force personnel have also been employed to maintain the vital needs of the nation, but they have not been used so often or on such a big scale.

Probably nothing has been disliked so much by civilians as enforced billeting. In early days, and in fact until comparatively recent times, the soldier usually came from a strata of society where education was scanty and good behaviour almost unknown. It was distasteful to be forced to give accommodation in decent homes to such men. Even now, when the conduct of the soldier is generally above reproach, there can be no doubt that a great deal of unnecessary damage to property is caused usually as the result of carelessness. It is true that the well-disciplined unit does very little harm, but every Army contains some units of poor quality and these will suffice to harm the reputation of the Army as a whole.

Until the last forty years the means of entertainment at the end of the day's work were very limited. When there were no cinemas or radio and few dance halls the most popular form of recreation for the majority of the population was in the public houses or their equivalent abroad. In consequence there was much drunkenness, and although this was by no means confined to the Services men in uniform were conspicuous, particularly soldiers in scarlet tunics. Whereas, too, sailors were to be

seen for the most part in and around the principal ports, soldiers were quartered in all the cities and most of the larger towns. As a result the Army got the bulk of the odium. Kipling's "Tommy this and Tommy that, oh chuck him out the brute" may not altogether have represented the attitude of civilians, but it was not a gross exaggeration of the situation.

Until the beginning of World War I the training of the British Army could be carried out effectively on ground belonging to the State and in the immediate vicinity of garrison towns: here there were tracts of country sufficiently large for the training of those days and of little value for other purposes. Once each year after harvest when damage was likely to be small the *Maneuvre Act* was enforced and large-scale exercises were carried out. Although gates were often left open and gaps made in the hedges, there were at that time no tracked vehicles and farmers had little cause for complaint. Modern Armies, however, with their high proportion of armoured fighting vehicles need wide areas for training purposes, and use them moreover throughout the year. It is, too, impossible to avoid a great deal of damage when an armoured force moves across country. There is not available in Britain enough waste land for this type of training; at one time the suggestion was even made that armoured forces should be transported to Canada, where there is far greater scope for their training. Failing some solution of this nature, it has been necessary to acquire land in this country which has agricultural value or which might otherwise have been preserved for its natural beauty. Whilst the Ministry of Agriculture has been endeavouring to increase the acreage under cultivation, the War Office has been seeking powers to acquire the land that it needs. As a consequence there has been criticism and ill feeling, and although this may be unjustified the Army has suffered appreciably in popularity.

Although conscription has been accepted in Britain as inevitable, any form of compulsion to serve has always been, and still is, resented. There is also a feeling of frustration among young men and their parents because, at a time when they would normally be embarking on their careers, they are prevented from doing so. Again, in the case of those whose education is to be taken to a higher level, there may be an unfortunate break with a consequent lack of continuity. Even when service is deferred until education is complete, there will be a hiatus before a career can be started. The disadvantages and hardships of conscription are, of course, common to all three Services, but the majority of young men are required to serve in the Army. The general dislike of conscription would be considerably mitigated if young men returned to civil life with the conviction that their time had been well spent and that they had gained something of lasting value. In the case of those who join the Navy and the R.A.F. this may often be so, but there are too many who return from service in the Army with the conviction that much of their time has been wasted. If there is justice in this complaint, and it appears to be too widespread to be brushed aside, then the fault must lie with the Army. First impressions count for a great deal, and during a conscript's first few months in the Army his time will be almost exclusively devoted to training. A great deal, therefore, depends on the quality of the training that he gets.

The art of training depends for success more on having the right organisation and on direction by experts than on the quality of the

instructors. It is clear that, with its many commitments our Army cannot find sufficient instructors of a really high standard, and this fact is often advanced as an excuse for poor results. The primary requisite, however, is that those made responsible at the higher levels for training should understand thoroughly how to organise and supervise it. They must appreciate that the teaching of techniques is of less importance than the making of a soldier. It is not difficult for experts to devise a training machine in which even indifferent instructors can produce good results. The mistake which we frequently make is to treat training as a side issue, and to suppose that senior officers, immersed in administration and other matters, can also find time to direct training. An entirely separate organisation for training is bound to be expensive, and for this reason has been discarded in peacetime; but until we are prepared to spend the small amount of money necessary, we cannot expect to get satisfactory results. The senior officers on whom success will mainly depend can well be chosen from those who have retired; similarly, ex-N.C.O. instructors could be brought back from civil life if it were made worth while financially; by these means, too, constant breaks in continuity as the result of postings could be avoided.

Even when training reaches a high standard there are still some items which appear to the recruit to be unnecessarily irksome and somewhat meaningless. It is difficult for him to understand why so much time is spent on drill and turn-out or to appreciate how discipline is inculcated by these means.

The standard of discipline required by the Infantry soldier must be of the highest: on his feet, often alone and in the forefront of battle, he is subjected to a higher strain than the rest of the Army or than the other Services, with the possible exception of air crews. The majority of the Army always has been, and still is, composed of Infantry. Discipline can only be learnt the hard way, there is no other that meets the purpose. The average individual cannot be expected to appreciate the hard way.

In times gone by the soldier served for many years and often in bad climates without adequate medical care. Even in good stations at home his barracks were usually uncomfortable; his food was adequate but lacking in variety and seldom well cooked or served. Many N.C.O.s were of the bullying type, and life in the barrack room was rough, without privacy, and sometimes degrading; his pay was a pittance. It is true that the normal civilian standards were much lower than they are to-day, but even so the soldier's life was unnecessarily hard.

Even as late as between the two world wars, although conditions of life in the Army were continuously improving, the long periods of enlistment made a soldier feel trapped. Many good soldiers would not re-engage, for when the trap opened they could not bring themselves to enter it again of their own free will. To a certain extent these long periods of enlistment may have been dictated by oversea commitments, but the difficulty and expense of transporting the soldier to and from abroad could have been overcome. Too much time was spent on "fatigues": although the provision of civilian employment companies was proposed, this excellent idea never materialised, mainly on account of expense. Semi-permanent employment of soldiers on non-military duties was allowed on a lavish scale: this custom had been instituted in much earlier days, when military training in peacetime was primitive and

when it was thought necessary to keep a soldier busy in one way or another so that he should not get into mischief. As a result of "fatigues" and "employment" there were seldom enough men available for realistic training and the enthusiasm of the young soldier soon evaporated. His main ambition was to end the boredom of soldiering as soon as possible; his method of expressing this aim was: "Roll on my seven" —seven years being the normal period of enlistment.

In war the Army was not always well led, and there have been cases where it was never explained to the general public why heavy casualties had to be incurred. It is difficult to estimate the amount of harm done in this way as the result of battles like the Somme and Passchendaele. In some campaigns, such as the Crimea, Gallipoli, and Mesopotamia, administrative arrangements broke down and the soldier was made to suffer a great deal of unnecessary hardship.

Whatever the reasons may be, and some have been described in the preceding paragraphs, any soldier who looks back on his time in the Army with distaste will be instrumental in adding just a little to its unpopularity among civilians. In the aggregate these individual criticisms of experiences in the Army through the years have created a smouldering of suspicion which can periodically be fanned into dislike.

After World War I there was a spate of books and plays which dealt very critically with the fighting. The writers were seldom competent to assess the reasons which may have justified the incidents that they criticised so drastically. They felt impelled to throw undue emphasis on the horrors and tragedies of war by which the imaginative were particularly appalled; in doing so they did not hesitate to discredit those whom they deemed responsible. Generals and staff officers were accused of ignorance, inefficiency, and even indifference to heavy casualties. The very fact that they did not run the same risks as those in the front line, or as senior officers in the Navy, was counted against them. Lesser writers and caricaturists followed this lead and approbrious terms such as "Brass hats" and "Colonel Blimps" became commonplace. Suspicion and criticism of generals were continued throughout the early years of the late war. It was even suggested at one period that our armies might be better commanded by foreign generals who had found asylum in Britain: this at a time when Wavell, Brooke, Alexander, Montgomery, and many others who later became famous were available and were already occupying important posts. The fact that the war produced such an outstanding crop of leaders in the British Army has reduced the amount of criticism of generals for the time being, but only for the time being. Civilians have such a fixed idea of what they believe generals are like that illustrious commanders are regarded merely as exceptions to the rule.

Of course, the authorities have not been blind to the fact that the public has been generally out of sympathy with the Army. Steps have been taken to try and popularise the soldier in the eyes of the nation. There is little doubt that the British Army can produce ceremonial and pageantry on a higher level than any other army or service, and that herein lies a powerful appeal to the general public. The crowds which daily watch the changing of the guard in London afford some proof of this. Military bands have never failed to attract crowds, and smart, attractive uniforms are always popular. The greatest attraction of all, however, has been

military tattoos. Not only did these serve to bring the Army to the notice of civilians in a spectacular light, but the excellence of the organisation and production together with the staff work connected with traffic control and car parks were the admiration of all. Unfortunately, the time required for preparing these tattoos was so long that ordinary military training suffered severely. In 1939 after a summer when so much time and energy were devoted to tattoos, the British Army was insufficiently prepared for war. It is, therefore, to be hoped that never again will tattoos on the pre-war scale be permitted, in spite of the value of showing its Army to the nation.

If the Army as a whole cannot be made really popular with the country as a whole, the remedy probably lies, as it has always done, in making portions of the country feel that one or more units belong to them; that they can father them and take a deep pride in their achievements and reputation. There is no doubt that counties have always maintained a real affection for their own regiments. It is sincerely to be hoped that recent attempts which have been made to meddle with this system will not be pursued further: the argument that reinforcements in time of war cannot generally be drawn from the right county is of little account. The main requirement is that in peacetime recruits should be drawn as far as possible from their own county, and that everything that can be done should be done to increase the link between regiment and county. Far from weakening a system which has proved its value for so long, it might well be extended with advantage to include arms of the Service other than Infantry.

Old Comrades Associations belonging to the different corps and regiments can be a most useful influence in linking civilians with the Army. Their reunions and those to celebrate anniversaries, such as Alamein and the Burma campaign, demonstrate to the general public that old soldiers take a pride in their past connection with the Army. The very fact that this pride is so strong must do something to increase the prestige of the Army in the eyes of the nation.

Except when a war is actually in progress it cannot be expected that the majority of civilians will take any interest in the leading military personalities of the day. In wartime, however, it is advantageous if the public is enlightened about the more prominent admirals, generals, and air marshals. There have been a few commanders who have caused offence by appearing to court publicity; yet such publicity is in itself desirable. It is unlikely that there will be complete trust in those responsible for military operations if there is no well-organised publicity as to their records and personalities. During the late war Public Relations departments had some success in bringing to notice the more prominent commanders, but still greater efforts are needed if civilians are to be made familiar with those who usually dislike advertisement in any shape or form. Self-effacement seems to be a characteristic of distinguished men which is more common in this country than in any other.

It is against this background of the attitude of the nation towards the Services and their leaders that the relations of statesmen and commanders must be considered. When a war breaks out it is probable that the Ministers then in office will have had some contact with the senior officers at the three Service Ministries. Judging, however, by past experience

there will have been sweeping changes in these posts at the end of a few months. It can thus be assumed that statesmen will have been appointed who are unaccustomed to working with military officers and who are not even acquainted with those then occupying high positions. Similarly, there will be newly promoted Service chiefs who may feel some suspicion of politicians and be uncertain in their initial dealings with them. There is nowadays, however, a heritage of good relations, which was certainly not the case at one time. It is therefore probable that it will not take long to establish a good mutual understanding; nevertheless, it is as well that each should know beforehand what to expect generally from the other. A statesman, before reaching the rank of Minister, must have had a wide experience of men and affairs. He may have been a lawyer or engaged in some other profession, or again he may have been prominent in business; in addition, it is probable that he has served as Under Secretary in one or more Ministries. Work in Parliament and in his constituency will have brought him in contact with a great number of different types of people and with a wide variety of problems. Although he may not be an expert in any particular subject, he is likely to have some knowledge about a great many matters. He will have been accustomed to making use of experts in order to extract from them the precise information that he needs; in doing so he will have developed the power of being able to get to the very heart of a matter in the minimum of time. He will be well practised in debate and argument, and although he may hold strong convictions, he will have learnt that compromise is often necessary. It is unlikely that he will be in the habit of giving direct orders in the military sense, but will expect subordinates to carry out his wishes, even if these have not been decisively expressed.

A military officer before reaching the heights in his profession will probably have held several independent commands, where he will have had some measure of power and almost complete responsibility. He is certain to be an expert in his own line and, like all experts, may be somewhat rigid in his outlook. At the same time it is probable that in the course of his career he will have held some appointments where he will have come into contact with political problems. He may not shine in argument or debate, but will have learnt to express his views clearly and incisively. He will adhere to these views strongly and be disinclined for any form of compromise. He will be accustomed to giving orders and to obeying orders, but, failing the receipt of what he construes to be an order, he will pursue his chosen course in the face of opposition from any quarter, however august.

In making an attempt to contrast the character and outlook of statesmen and senior military officers too much stress may have been thrown on the differences between the two: yet differences do exist, they must be expected, and allowance made for them by each side. As a rule, however, co-operation between two able men who are anxious to co-operate should present no insuperable difficulty.

If and when a war breaks out the attitude which the nation has developed during peacetime towards the armed forces will influence the outlook of statesmen and Service chiefs. The initial strains of war soon discover any weakness, and these strains can only be met if solid foundations of goodwill and understanding have been laid beforehand.

PART II

IN WAR

When wars were waged almost exclusively between rival navies and between rival armies the civilian populations, except when their countries were actually invaded, were not intimately involved. The conduct of operations was left almost entirely in the hands of the chosen military leaders and, although ultimate control of the armed forces was retained in the hands of the head of state, there was no particular reason for a tighter control in time of war than in time of peace. Nowadays, however, when wars are fought out between nations and not only between their armed representatives, the case is completely different. With the advent of air attacks on cities, of submarine attacks on shipping, and with the ever-growing development of propaganda in all its forms the whole nation is closely involved. Attacks on the enemy's means of livelihood, on his industrial productivity, and on his morale, together with defence against such attacks, have become comparable in importance with battles lost or won. The correct assessment of the value of these newer features in relation to the purely military effort must be made by the head of state, and only by him, for there can be no one else in a position to do so. Military leaders, whether chiefs of staff or commanders, will be concentrating all their efforts on achieving military victory; chiefs of the various civil departments will be straining every nerve to attain maximum efficiency within their own spheres; industrialists will be striving to produce all the war material required of them; meanwhile the people may be brought by bombing, by privation, and by anxiety almost to breaking point. When all these are obsessed with their own problems and difficulties none can be expected to take a detached view. Often, too, their special interests may clash with those of others: there must, then, be someone standing aloof from and superior to their conflict who can resolve their difficulties and co-ordinate all their efforts. There is only one authority that can perform this task, the head of state, for he alone has the power of final decision.

It is indeed a tremendous responsibility to place on the shoulders of one man and everything possible must be done to ease the burden. In the first place it is essential that he should have the whole nation solidly behind him: this must be so because of his prestige and personality and not merely because he happens at the moment to be the leader of the nation. This implies a colourful personality and one that appeals to the common man. Among the weighty decisions that he has to make some will inevitably be wrong: no nation under the stress of war will stomach the mistakes of a nonentity, whereas they will be inclined to condone the errors of one whom they respect and admire. In any case, the head of state cannot afford to have his decisions influenced in the slightest degree by the effect which they may have on public opinion.

It is too much to expect, however, that there will not be constant criticism, particularly when there are military failures and disappointments. In every country there are to be found men and women who cannot, or will not, believe that their judgment in matters, great as well as small, is not as sound as that of their leaders. They see so clearly the mistakes that are being made, and still more clearly the mistakes after they have

been made; they are quite genuinely convinced that they can find or could have found, better solutions. It is when these critics are men and women who by virtue of success in their own careers are well-known figures to the public that they can become dangerous. Napoleon once stated that the best generals were those who made the fewest mistakes. Although a head of state will usually have more precise data on which to base his decisions than has a general in the stress of battle, some of his decisions are bound to have unfortunate results. The nation as a whole will seldom realise that their trusted leader has made mistakes unless these are pointed out to them. If the public has been thus made restless and discontented it is in no frame of mind to appreciate that their leader may be more often right in his policy than any other possible competitor. It cannot be easy for a head of state to concentrate all his efforts on the present and the future when he knows full well that his errors of the past are being stored up as possible evidence against him.

In this country it would seem to be almost essential that there should be a Coalition Government. It is too much to expect of any Prime Minister that he should have to deal with the cut and thrust of party politics when there are so many more vital matters in which his time and energy should be absorbed. In the United States it is perhaps worthy of consideration that the stress and strain of a presidential election should be avoided in war time. It must be difficult for the President to concentrate on his supreme task at a time when he knows that his continuance in office is under review. It would also seem undesirable that the nation should be diverted in any way from its main purpose. Any people when keyed up under the conditions of war will not hesitate to find the means of replacing its head of state if and when it is thought desirable.

The theory of Cabinet responsibility holds good in this country during time of war as well as in time of peace. It is, however, undeniable that a war cannot be conducted efficiently by any committee. During World War I the vacillations of the Cabinet over such questions as to whether Gallipoli should be evacuated in 1915 or not make it obvious that clear-cut and rapid decisions can only be expected from an individual and not from any committee. Although there are a great many matters mainly connected with home affairs which can be settled by the Cabinet, there are some decisions connected with military operations which must be left in the hands of the man chosen to lead the nation, and in his alone.

Each head of state will gradually evolve the machinery for control which suits him. It does not follow that the organisation set up in the last war will necessarily suit the man who has to use it in the next war. It is, therefore, necessary when planning such an organisation that it should be kept flexible enough to be changed as required.

It has always been a principle of organisation that no individual can be expected to handle with efficiency more than a certain number of subordinates. The capacity of individuals varies of course, but there are few who can handle more than ten. It is clear that when co-ordinating the efforts of a whole nation the head of state will have so many departmental chiefs with whom to deal that some measure of decentralisation will be imperative. If, however, decentralisation is carried too far control by the head of state will be so distant and indirect as to become

ineffective. There is no doubt that if the head of state stands so aloof that he has to make up his mind only from provisional decisions presented to him by subordinates, he cannot really judge the issue. At the risk of appearing to interfere with subordinates he must be able to attend any committee in person and hear the arguments and debate on any problem which he deems to be of sufficient importance. A proviso of this nature will allow more decentralisation and yet enable the head of state to acquire that intimate knowledge on important issues which will help him to come to the right conclusions.

During the recent war it was suggested at least once that the Prime Minister should appoint some other statesman as Minister of Defence. Although the ostensible reason behind this proposal was to lighten the load which the Prime Minister was bearing, there was also a suspicion in some quarters that it was inadvisable for the head of state to take such an active, personal interest in military matters—an interest which might, moreover, lead easily to actual interference. Mr. Churchill reacted strongly against any idea of appointing a separate Minister of Defence. There can be no doubt that he was convinced that it was imperative for him to combine the two appointments in his own person, but there does not seem to be any insuperable reason against the office of Minister of Defence being given to some statesman other than the head of state. It may well be that another Prime Minister would prefer not to become immersed in all the detailed matters with which the Ministry of Defence has to deal and would wish to have some other statesman to answer questions in Parliament. The argument would be reinforced if there is available someone particularly suited to be made Minister of Defence.

If the head of state should decide to appoint a separate Minister of Defence the question then arises as to whether the appointment can best be filled by a military professional or by a civilian, assuming, of course, that two such men are available and that both are of sufficient calibre for the post.

There would appear to be advantages in choosing a military chief, for only an independent military expert can hope to decide on the merits of the different points of view expressed by the heads of the three Services and so present a balanced judgment to the head of state. Just as nowadays it is generally accepted that a Supreme Commander must be appointed to co-ordinate the actions of the three Services in a campaign, so it would seem logical that there should be similar expert control of the Chiefs of Staff. On the other hand, it would not be easy to find a military expert with so much knowledge of all three Services as to be able to appreciate fully the conflicting opinions of the Chiefs of Staff. Unless he were unquestionably competent in this respect he might quite unintentionally distort the facts when reporting to the head of state, who would have no other military expert to consult. There would be no question of bias in favour of the Service to which the Minister of Defence belonged or had belonged, but there is danger in having such a super-military expert in that it canalises too narrowly the flow of military opinion.

The appointment of a civilian Minister of Defence is to be preferred, provided that he does not act as a barrier to the head of state receiving direct military advice when he needs it. There will be trust and understanding between two statesmen who have probably been colleagues for

a long time. If the Minister of Defence is also a member of the House of Commons he can relieve the Prime Minister of many parliamentary duties.

Although one head of state will choose one system and another will choose a different, each according to his character and experience, there can be little doubt that if he can also act as Minister of Defence it is to be preferred. In wartime the centre of gravity of the national effort must lie in the Ministry of Defence, and it is important that a head of state should exert his direct influence where the most important matters are under review and without the interposition of a third party, however efficient.

The arguments for and against the appointment of a separate and permanent chairman of the Chiefs of Staff committee are very similar to those already discussed when considering a military Minister of Defence. The system in this country, where one of the Chiefs of Staff acts as chairman, has proved effective in practice, and although the appointing of a separate chairman may present a tidier organisation mere tidiness can be carried too far. If in addition to a separate chairman of the Chiefs of Staff committee there is also a Minister of Defence other than the head of state, the latter becomes altogether too remote from the heads of the Fighting Services.

A man who has achieved so high a position as to be leader of the state in wartime will have great experience in politics, economics, foreign affairs, and many other matters. He will therefore know as much as his Ministers in this field and can conduct discussions with them on equal terms. Although, on the other hand, he may have some knowledge of military matters, he must have no pretensions to being an expert. At times he may feel it extremely irksome to find himself at variance with his Chiefs of Staff and reluctant to accept their advice. When Hitler found himself in this position he replaced his military advisers by more pliable men such as Keitel and Jodl. It must be remembered that Chiefs of Staff are not usually well known to the public and there will not necessarily be dissatisfaction, even in a democracy, if they are replaced. Provided, however, that the head of state is prepared to tolerate considerable opposition at times and if the Chiefs of Staff are determined to stand by their opinions, then from this play of opposing forces it is likely that sound decisions and effective plans will emerge. Wherever a man with the widest responsibilities, and a consequent shortage of time to devote to any one subject, is confronted with experts determined to present their case fully, there is likely to be misunderstanding and perhaps impatience. It is therefore to be recommended that someone with expert military knowledge should be appointed to the personal staff of the head of state. This individual can then interpret his chief's views at length to the Chiefs of Staff and explain more fully their views to him. The danger that this expert may become an alternative source of military advice must, however, be avoided. Although by this means a very busy man may find his relations with his Chiefs of Staff made easier, they should not be too easy: for it is from the clashes of opinion that the sparks will fly, and without sparks their will be no genius in planning. During the recent war Mr. Churchill was continually producing new ideas for his Chiefs of Staff to shoot down if they could. Although a proportion of them came to nothing, sufficient were

of enough value to make it all worth while. Men who are preoccupied with affairs of vital importance generally resent having to deal with "brainwaves," but success in any walk of life usually depends on there being too many ideas rather than too few.

The admirals, generals, and air marshals with whom a head of state will be dealing constantly will be his Chiefs of Staff and one or more Supreme Commanders. The very name of Chief of Staff suggests an individual with the upbringing and mentality of a typical staff officer, but in fact this is seldom the case. A Chief of Staff is the head of his Service, and is unlikely to have acquired by success only in staff appointments a reputation of sufficient magnitude to justify his selection to the highest post in his Service. To name only a few recent Chiefs of Staff—McArthur, Marshall, Bradley, King, Brooke, Montgomery, Slim, Cunningham, Portal—all these were essentially commanders and men who had earned their reputations primarily in command.

If, then, it is almost exclusively with men of the commander type that the head of state will have to deal, it is worth considering what manner of men they are likely to be. Commanders seem to vary between two extreme types. At one extremity is the man who revels in improvisation and at the other is the man who trusts almost entirely to careful planning.

The first of these is dynamic, quick to think and to act ; he is at his best in a moving battle when the situation is constantly changing and when instantaneous decisions are imperative. Such commanders appear to possess a flair for guessing right even when, as is generally the case, their inspired guesses have to be based on information which is generally scanty and often inaccurate. This flair is possibly due to their minds working along grooves which have been worn by much study and by long experience. They seem to be so confident of being able to deal with any situation when it arises that they often neglect thorough planning and are apt to be impetuous to the point of rashness. The very nature of battles at sea and in the air demands that a high proportion of the less senior commanders should belong to this category. Among soldiers almost all outstanding leaders of cavalry and armoured forces must possess these qualities in abundance. Among recent examples Rommel and Patton seem to be outstanding.

The second type of commander is a man who depends almost entirely for success on careful planning ; he trusts in foresight and shuns the need for improvisation. Like a chess player, he will endeavour to think ahead for as many moves as possible. He will be able to lay on a battle with great skill, particularly a "set-piece" battle, and will be fully prepared to meet such eventualities as can be foreseen. As soon, however, as a battle moves beyond the stage of original planning, as it always will, he is apt to lose control of events. He will be hoping for a pause during which he can think out and set into operation another deliberate plan. Any commander who is inclined to welcome a pause in battle will be tempted to create one deliberately and thereby miss fleeting chances of which he may be entirely oblivious. As long as he holds the initiative he may achieve a measure of success by these plodding methods, but he is unlikely to be able to exploit victory to the full. When, however, the enemy has the initiative he will be at a serious disadvantage and will find it difficult to produce the necessary counter-measures in time. Many German

commanders have belonged to this category, and among them it is probable that Moltke and Ludendorf both had these limitations.

In between these completely different types of commander will be found the better-balanced officers, but even with them it is certain that their temperaments and mentalities will incline more to improvisation or more to deliberate planning. The higher the appointment which an officer is called upon to fill the further will he be from the actual atmosphere of battle, until at the very top he will be concerned more with the slow tempo of strategy than the kaleidoscopic changes of tactics. The brilliant opportunist will find his ceiling rather lower down: in spite of an outstandingly successful career the posts of Supreme Commander or of Chief of Staff are not for him. This is just as well, for he is liable to be quick-tempered, intolerant, and incapable of cool, dispassionate discussion and so altogether unsuited for harmonious relations with a statesman. On the other hand, those who do in fact rise to be Supreme Commanders and Chiefs of Staff are usually far-seeing, logical, and possessed of sound judgment of man and affairs. They will be able to meet a head of state on the same intellectual level and to discuss their problems with him with restraint and understanding.

There are many factors to be taken into account in the selection of a Supreme Commander, apart from the fact that the right man may belong to the wrong nation. It has been assumed, perhaps on too little evidence, that success will depend more on his leadership, personality, and power of co-operation than on his military skill. The Supreme Commander who has been put to a more searching test than any other is Hitler. It is true that when Germany was meeting with success after success he had not then appointed himself Supreme Commander, but he must be given the major credit. When, however, failure and even disaster were threatening Hitler was incapable of handling the situation. His temperament was, of course, quite unsuited for supreme commander, but being all-powerful he did not need to be tactful, co-operative, and persuasive. His failures, then, as a Supreme Commander can be attributed mainly to lack of military knowledge and experience in the various grades of command. This is the ultimate test of any commander, whatever the scope of his command, to what extent he can snatch victory from defeat and whether he has it in him to rise above the threat of impending disaster. Unless a man chosen for command, subordinate or supreme, has the military skill and knowledge to deal effectively with a real crisis he is not fitted for the post. Unless he has clearly shown such ability previously, his appointment as Supreme Commander is taking too much on trust and must be something in the nature of a gamble.

Although military skill and experience are prerequisites for every commander of whatever grade, a Supreme Commander should possess many additional qualities. He must have that great type of leadership where subordinates are proud and happy to serve him and feel impelled to co-operate smoothly with each other; such a state of affairs is unlikely unless he is entirely free of jealousy, is thoroughly human, and beyond ambition. He will find it a great asset if he can express his views convincingly, both orally and on paper, and he must be able to hold his own in discussion, even with those who have more acute brains than his own. The greater his prestige as the result of previous military success the

easier he will find it to deal with subordinates who may often be difficult, with Allies who may be over-concerned with their national pride, and with statesmen who may be tempted to interfere. Moreover, one whose prestige is high will retain the support of public opinion in his own country and in those of his allies despite a proportion of failures and disappointments. A career in the Services does not tend to breadth of outlook, although this is less true than thirty years ago. All those, however, who reach high command should have sufficient knowledge of political affairs and economic values to appreciate their influence on strategy. Such knowledge will also enable a Supreme Commander to understand the points of view and difficulties of any statesman with whom he has to deal. A President or Prime Minister may be tempted to attach too much weight to an easy temperament when deliberating on the choice of a Supreme Commander. It is true that a man who is universally popular is likely to avoid friction in a post where the causes of friction are many, but it must never be forgotten that he is first and foremost a commander and so must possess the qualities and attainments of a commander.

The interaction of politics and strategy must be appreciated fully by both statesmen and military leaders. It has been said that war is a continuation of politics in another form, although in recent years it would almost seem as if in some countries politics were a continuation of war in another form. Failure to realise the intimate connection between the two has led either to catastrophe or to lack of complete success.

It is at least possible that the German Army could have defeated the French Army in 1914 without moving through Belgium. Unless the neutrality of Belgium had been infringed it is doubtful if the British would have entered the war at this juncture. In any case German diplomacy would have been given the opportunity of delaying the entry of Britain into the war. Their military leaders, however, insisted on a rigid adherence to the Schlieffen plan, which demanded this wide turning movement through Belgium.

In contrast, it was largely due to the diplomatic success achieved by the German-Russian treaty of 1939 that the full strength of the German Army could be deployed against the Allies in France during the spring of 1940: the Germans were thus able to concentrate all their efforts on this main task without having to look over their shoulders. Hitler's failure to achieve an equal diplomatic success with General Franco created a buffer between the German Army and Gibraltar and so enabled us to use this gateway to the Mediterranean. Again, in the early years of the war the German Navy was restricted in its use of U-boats in the Atlantic for fear of sinking American shipping and so bringing that country into the war.

The sending of British troops to Greece in 1941 was unlikely to contribute directly to victory, and in fact created a dangerous risk to our depleted Army in North Africa. Military chiefs, however, as well as statesmen, appreciated that it was politically necessary not only to bolster up Greece but to influence feeling in the Balkans, particularly in Turkey.

There can be no doubt that the declaration at Casablanca as to "unconditional surrender" hardened the German will to resist during the last months of the war. This declaration was made presumably in order to reassure Stalin as to the British and Americans being resolute to fight to

a finish. It is questionable, however, if the full implications of the words so used had been realised.

Throughout the war Stalin was looking beyond victory and his strategy was dictated by the claims which he hoped to stake in post-war Europe. He seems to have been particularly sensitive about any move by his allies towards the Balkans. If at the time the U.S.A. had taken a less detached view about the future of Europe, an advance by Allied forces in 1944 or 1945 deep into the Balkans might have paid big political dividends in the long run. Instead it was preferred to pursue a purely military course by moving the bulk of the troops available through Southern France with the object of helping the campaign in Normandy. In the light of our knowledge after the events it is clear that this help was not essential, but when the plan was made it was probably the most promising from a purely military point of view.

Again, during the final stages of the war in Europe military considerations were allowed to override political ones. At some period of the campaign, perhaps after the break out from the Normandy bridgehead certainly after the crossing of the Rhine in force, it must have been apparent that victory in the field was certain; from this moment political considerations might have been given more weight. The entry by Allied troops before the Russians into Berlin, Prague, and perhaps Vienna would have had immense effect. The prestige of the actual liberators in Czechoslovakia and Austria was bound to influence the future. It is, of course, a most difficult point to decide when a possible increase in military casualties has to be weighed against political advantages, which at the time may seem nebulous.

More recently in Korea General McArthur became convinced that in order to achieve his object an extension of the war into China and the employment of Nationalist troops from Formosa were necessary steps towards complete success. As a military commander he was fully justified in exploiting every means to obtain a clear-cut victory. The President of the United States, on the other hand, was equally justified in restraining him. A statesmen must see the actual victory in its right perspective and appreciate what the aftermath may be. When a military commander and a head of state can each in their respective spheres feel that right is on his side, the views of the latter must always prevail. It is not difficult, however, to realise that a commander of vast experience in war must feel frustrated when he is threatened with the possibility of losing a campaign, or of not obtaining complete and rapid victory as the result of a policy imposed from above: a policy, moreover, which appears from his point of view to be mistaken.

There may be some truth in the statement attributed to Clemenceau that "war is too serious a business to be entrusted to soldiers." In those days military commanders were more inclined to go their own way, looking upon statesmen as a hindrance rather than a help to the successful prosecution of war. Today it would be generally accepted that statesmen and commanders must work together hand in glove, and that Chiefs of Staff who have a position of greater detachment than commanders must do all in their power to further this co-operation.

Although a head of state is ultimately responsible for political decisions he may feel that a Supreme Commander should be given some political

power. Or again, unforeseen circumstances may arise which demand political action by a commander on the spot, there being no time to refer the matter to the head of state. It is problems such as these which may adversely affect harmonious relations between the two.

When, soon after the landing of Allied troops in Algiers General Clark (U.S.A.) met Darlan, his main preoccupation was to prevent French resistance to exploitation of the initial success. It was apparent that Darlan was the only individual on the spot whom the French troops would obey. There was no time for either party to refer the matter to higher authority, for delay in coming to agreement might have imperilled the lives of Allied soldiers. The very fact of Darlan being the medium of negotiations did accord him a certain degree of recognition by the Allies. Moreover, in order to obtain agreement, it seems that General Clark held out hopes to Darlan of his being given some political status in North Africa: this inducement appeared necessary to clinch the bargain. No one could have anticipated that Darlan would have been in North Africa at this juncture and so no steps had been taken in advance to deal with such a contingency. Although there was some disquietude, particularly in England, over the undesirability of dealing with a man such as Darlan, it was generally agreed that General Clark had no option in the matter. It is interesting to speculate as to what would have been the reaction if Laval had been in Algiers instead of Darlan. Presuming that French troops would have obeyed Laval's orders, and only his, it still seems as if General Clark would have been justified in dealing with him, although he would have been loath to do so. The test of any action such as this by a theatre commander is one of time. If delay will seriously prejudice the issue he must surely take the responsibility on his own shoulders.

It was presumably owing to the inevitable delay in referring political problems to Washington that the idea seems to have grown in General MacArthur's head, during his campaigns in the Far East, that he had political independence. This idea may well have been fostered by the fact that he was given a political staff. Further colour is given to this impression by a statement he is reported to have made, viz. "A theatre commander, in any campaign, is not merely limited to the handling of his troops, he commands the whole area politically, economically, and militarily." This is a clearly worded statement which, if correctly reported, cannot be accepted even as a guide for future campaigns. No head of state should abrogate his responsibility to such an extent for it would entail political affairs of magnitude being settled by the commander on the spot even if time did not compel so immediate a decision. If political responsibilities which must be reserved by the head of state and those which can be delegated to a Supreme Commander are not clearly defined there is certain to be misunderstanding and probably friction between these two individuals. Yet when a campaign is taking place at some distance from the seat of government it is a matter of great difficulty to settle on a division of responsibility which will cover all circumstances.

In such conditions it may be advisable to appoint a statesman of ministerial rank to accompany an expeditionary force engaged on distant operations. This statesman would be directly responsible to the head of state and in the case of an Allied Army he would have to be appointed under mutual agreement. Although he would work in close co-operation

with the Supreme Commander he would not be on his staff or under his orders. He would decide which political matters should be referred for decision to the head of state: minor affairs would be settled by him on the spot and being attuned to the policy of his Government his decisions would probably be more appropriate than those of a military chief. Incidentally, he would free the Supreme Commander to concentrate on the military side of the campaign. Such a system has been tried successfully by this country during campaigns in the Middle East and the Far East. A plan of this nature is much to be preferred to one which gives a Supreme Commander a special staff for advice on political matters. A staff officer cannot have a divided allegiance: he is responsible to his commander, and to him alone. The combination of a strong-minded commander and an ill-balanced political staff officer may have most unfortunate results.

There remains the question as to what contact, if any, there should be in wartime between statesmen and the armed forces generally, apart from that with higher commanders. There have been a few statesmen whose prestige has stood so high and whose personalities have been so pronounced that visits by them have acted as a tonic to the troops. Such statesmen are, however, few and far between. On the other hand, there are many statesmen who have to deal frequently with problems relating to the armed forces. It is difficult for them to judge the effect of any decisions arrived at unless they can gain first-hand experience of the outcome of these decisions. In their own interests, therefore, it is advisable that they should see on the spot what really happens as the result of orders issued from above.

With a view to summarising the relations between statesmen and the armed forces, it can be stated that:

- (1) The almost unbridgeable gap that appeared to exist formerly between the outlook of statesmen and of commanders has narrowed appreciably. The most recent evidence to support this assertion is the appointment of two distinguished soldiers to the British Cabinet.
- (2) Public opinion, which has always been favourable towards the Royal Navy and the Royal Air Force, shows some signs of improvement towards the Army. Good feeling towards the Services by the nation in times of peace must be fostered, for it will lead to wholehearted co-operation in war.
- (3) Further thought is needed in order to perfect a system which will obviate friction between Ministers and military chiefs and which will make the most of their joint efforts. Yet the system which worked so well in the last war will not necessarily be equally successful with different personalities in the next war.

The strides which have been made in all these respects in the past thirty years afford good hope for the future.

HAROLD FRANKLYN

CHAPTER XVIII

THE ARMY AS SEEN FROM PARLIAMENT (April, 1951 to April, 1952)

DEFENCE POLICY

"THE OBJECT of this White Paper is to take stock of the progress made to date in fulfilling the programme." This statement appears in paragraph 3 of the Statement on Defence 1952 (Cmd. 8475). That document, the first important pronouncement on the subject by the new Government, formed the basis of the discussion which subsequently took place in the House of Commons on Wednesday, March 5, 1952. It is a sound point of departure for our own consideration of defence measures in so far as they affect the Army.

The programme of the late Socialist Government referred to was "to build up an Army the equivalent of ten Active Divisions and other supporting units; and to produce modern equipment for the major part of those forces and for Anti-Aircraft Command." With that general statement the present Government associates itself.

In the field of defence generally and the Army in particular there is fortunately considerable continuity of policy between the late Government and its successor. The main differences are in the methods to be adopted in achieving the policy and of course in the men who are called upon to carry them out.

Where there is radical disagreement is in the camp of Mr. Aneurin Bevan, who cannot be said to have a great personal experience of the subject, and his followers Mr. R. H. S. Crossman, one of the most belligerent of soldiers of the pen, and Mr. Harold Wilson, whose wartime battles were fought in the Ministry of Fuel and Power. Their case was put forward by Mr. Crossman during the course of the Defence Debate, and for that reason his speech must be studied with some attention.

In moving the motion approving the Statement on Defence, Mr. Churchill declared: "My first impression on looking round the scene at home in November as Minister of Defence was a sense of extreme nakedness such as I had never felt before in peace or war." It was for this reason that two measures were taken to assist the Army. The Home Guard was established once more and those employed in Training Establishments were formed into Active military units.

On both these issues there is ground for comment. To begin with, the Home Guard must constitute an additional training commitment for those elements of the Army, both Regular and Territorial, operating at home. In both cases they are already heavily committed, and there is consequently the very real danger that the additional duties involved will tend to decrease efficiency all round. If the Home Guard is to be effective it must be prepared in particular to deal with the threat of paratroop invasion. That requires training of a sort which it is unlikely that the Home Guard can organise from its own resources.

It would be very dangerous if the Home Guard were to be formed purely with an eye on the situations with which it had to deal in the 1939-45 war. It will be equally disastrous if those who organise it are only qualified to fight the last war and have no conception of what might be the character of the next.

Again, those who had similar tasks thrust upon them in 1940 will take leave to be somewhat sceptical as to the real striking power of establishments who of their very nature tend to be manned by those whose military aptitude tends to take a more scholarly or clerical turn. The theory that the pen is mightier than the sword is capable in that event of being misapplied. Nevertheless, no-one can deny the rightness of ensuring that every military establishment should be at least capable of defending itself and should never constitute a commitment for some other military unit, and that every mobilisable resource should be mobilised. The dangers inherent in the policy are first that too much reliance should be placed upon such units and secondly that the main military structure should be weakened rather than strengthened by their existence in view of the training and administrative burden involved.

Mr. Churchill concluded his observations by referring to the fact that the rearmament programme would have to be slowed down. He said :

It is a curious commentary on British politics that it should fall to a Conservative Government in the face of dire financial stress to have to reduce or slow down the military defence programme and expenditure on which the Socialist Government had embarked and to which they have committed the nation. We must be guided by realities, and while trying our utmost to carry out the programme we must not mislead the country into expectations beyond what its life energies can fulfil.

In the debate Mr. Attlee made a statement which fairly summarises the issue :

Therefore, on that general position, I say that we have to continue to rearm, but we have also to be aware all the time, because it would be folly to have a prosperous economy which was defenceless and it would be equal to folly to try to defend an economy in ruins. It is quite clear that we have to strike a balance in this.

It is on the question of the striking of this balance that the really radical difference of political opinion exists in the House.

Mr. Crossman speaking during the course of the Defence Debate made the position of the "Bevanite" section of the Socialist Party quite plain :

I put it to the Prime Minister that his arms programme is far too small if there is a genuine danger of imminent war. As he himself admitted, it is fantastically too large to sustain in face of a yawning trade gap. It fails on the military side ; it fails on the economic side ; it ruins us economically, and it does not give us protection.

That is a strong indictment. It can only begin to be sustained if it is admitted that the threat of war has in fact so far subsided since 1951 and also if the British rearmament programme is studied as an isolated operation. To assume the first situation is very dangerous, not the least so because it is very clearly what the Cominform would like all its opponents to believe. If in fact the menace of immediate conflagration has eased

it is because the measures of Western rearmament have acted as a deterrent. To reduce that deterrent before the sources of combustion are eliminated is like turning off the water when the fire is still under way.

The second part of the thesis is a piece of supreme isolationism which takes no cognisance of the Commonwealth contribution, the N.A.T.O. structure, or the United States resources. When such a position is taken up by someone whose knowledge of the facts is undoubted it must be regarded either as unparalleled lack of judgment or as political dishonesty of the first order. Like so many contributions coming from the same quarter, they make exciting debate, contentious reading, but disastrous policy.

The conclusion of the Defence Debate was marked by a division which was the most accurate indication of the political position on defence issues so far given. On the first count the official Socialist opposition divided against the competence of the administration but accepted the implications of the White Paper. On the second count the "Bevanite" fringe divided against the principle of the defence measures—and in so doing they showed the full extent of their strength to be in the region of fifty votes.

THE NEW MANAGEMENT—AND THE OLD

It would not be inappropriate at this point to examine the new management installed as a result of the General Election, and at the same time to glance backwards at their predecessors.

The new Secretary of State for War is well regarded by all. In the recent debate on the Army and Air Force Bill he was referred to by Mr. Chuter Ede as "a great Parliamentarian," which was no mean tribute from one of the most experienced Parliamentarians in the House to-day. Mr. Attlee, on the other hand, has criticised the appointment of a Regular soldier to the War Office. The objections are obvious, but it is because they are so that Mr. Churchill's decision can most easily be justified. The objections are, moreover, not peculiar to the Service ministries; they apply everywhere. It is therefore always necessary to decide whether it is better to have an expert in charge of a department or someone who knows nothing about the job. The arguments on both sides balance out and the deciding factor must be the character and personality of the man concerned. For that reason the appointment of Antony Head is an outstanding success.

He is in direct contrast to his predecessor. Mr. Strachey had no military qualifications. He had, however, a highly developed intellectual approach which by its very contrast to the normal military methods undoubtedly had a contribution to make.

Both Mr. Strachey and Mr. Head have been well-served in their immediate subordinates. Mr. Woodrow Wyatt is one of the most assiduous and astute members of the Socialist party. In office he brought to bear upon military problems a quick and original mind. Mr. James Hutchison, who has behind him a most distinguished war record, would appear to be a man after the Army's own heart. He is meticulous, painstaking, and unscrupulously fair; above all things, he is a fighter for any cause for which he stands.

It is highly desirable that the Army, and all the Armed Services for that matter, should be kept out of the field of fierce party political strife. It is therefore encouraging to find that with the change of Government there has been no violent upheaval in military policy. The long periods which have to elapse between the moment that a project is first conceived and the date when it reaches practical fulfilment make such upheavals not only undesirable but organically disastrous.

The new management differs from the old mainly in methods of approach. There is perhaps less suspicion that all those in authority are personally related to Colonel Blimp, that they are militantly imperialist, and that they are determined to live in a world of personal privilege. There is, moreover, a truer balance of approach to matters of administration and in particular to discipline which is the result of a working knowledge of the Army in both peace and war. The new management, in fact, talks a little less loudly about man management but knows more about it.

ARMY ESTIMATES 1952-3

The Memorandum of the Secretary of State for War accompanying the Army Estimates (Cmd. 8477) contains in its preface a comparison of estimates since 1949, which is reproduced here for the record :

	1949-50	1950-51	1951-52
Gross Expenditure	£ 356,200,000	£ 341,600,100	£ 466,520,100
Appropriations in Aid	51,500,000	42,600,000	47,720,000
	<hr/>	<hr/>	<hr/>
	£304,700,000	£299,000,100*	£418,800,100*

* Excluding Supplementary Estimates.

The estimate for 1952-53 is :

Gross Expenditure .. ..	..	..	..	£ 585,970,000
Appropriations in Aid .. ..	..	..	..	64,470,000
Net Expenditure .. ..	..	..	..	<hr/>£ 523,500,100

The increase in gross expenditure is accounted for by Vote A, expenditure on increase in personnel, the growth of the Territorial Army and the Supplementary Reserve. Wages and prices have in addition played their part. Vote 7, stores, is up from £147,340 last year to £234,000. There is also an increased provision under Vote 8 for works.

Appropriations in aid are increased by sales of food to forces families and by sale of stores and by colonial contributions.

These estimates have been appreciably lightened by the decision of the United States of America to grant economic aid towards the burden of defence undertaken by the United Kingdom—one of the beneficial results of the visit of Mr. Churchill to the United States.

The debate on the Army Estimates which took place in the House of Commons on March 10 and 11 was one of the less militant in a session which has been one of constant mêlées.

The Secretary of State in presenting the estimates said : "The duty which confronts myself and the War Office as I see it, is to develop to the

maximum extent the strength of the Active and the Reserve Army by means of organising its manpower, equipment, and training so that it can play its full part in the cold war, in meeting our strategic commitments, and in making a full contribution in the event of a hot war." He then added a sentence which sums up the whole approach of the administration : "It is my chief responsibility, and indeed that of the House, to see that in return for these two very considerable sums (a financial expenditure of £491½ millions and a manpower commitment of 555,000 all ranks) the nation gets good value for money."

Mr. Head went on at once to deal with what must be regarded as the heart of the whole matter—the development of the Regular Army. Without that development there can be no efficient use of manpower, there can be no real value for money.

The task is one which faced the previous Government and with which they made some progress in the important matter of pay. As the new Secretary of State indicated, that is not the total problem. What has to be done is to make the Regular Army a career which competes in remuneration, conditions, status, and usefulness with civilian careers. It is also imperative that there should be interchangeability, so that a Regular soldier can easily turn into a civilian without finding himself unemployed or unemployable.

The closer relationship which now exists between the Regular Army and the civilian, due originally to the war and now to National Service, is a vital factor in the solution of this problem. It is a factor which can result in great advance or in a retrograde movement. That will depend first on the Government's handling of the situation and secondly on the Regular Army's handling of the civilians.

Mr. Head has shown an awareness of this position which augurs well for the future so far as his part of the bargain is concerned.

The response to recruiting as a result of the last adjustments in terms of service offering a special short-term engagement has been encouraging. In January, 1951, there were 1,999 recruits; in January, 1952, there were 2,632; in February, 1951, there were 1,637; and in February, 1952, the number was 3,496.

There is now to be a further new period of engagement for the young man wishing to make the Army a life-career. This is the 22-year term allowing for 3-year periods of termination, and providing a term of service until a man is 55.

Mr. Head went on during his Estimates speech to analyse the reasons for discontent with Army life. These were compulsory retention of Regulars beyond their term of service, cross-posting, the separation of men from their families, and unemployment after leaving the Service.

In order to deal with these points the Secretary of State intimated that he had taken or would take the following action :

Retention. That was to be eliminated as a matter of policy. No-one to be kept on in this way after September, 1953.

Cross-posting. To be minimised. In all armoured car and infantry units there is to be a three years' battalion tour. In this connection the creation of seven new second battalions will assist the process.

Separation from Families. Steps to be taken to increase provision of married quarters abroad. Special measures to be announced shortly for the education of children who cannot follow their fathers.

Employment after Service. Closer co-operation with the Ministry of Labour and the Trade Unions envisaged.

During his speech the Minister announced a new measure connected with the provision of officers which must be regarded as particularly constructive as part of long range policy. This is the proposed extension of the Military College of Science as an alternative method of entering the Army to Sandhurst. Having regard to the immense field of technical advance in the Army, this is a move very much in step with modern developments which is likely to influence a new and important section of the community, the scientifically minded, to take up the Army as a career.

All these measures are calculated to break down old prejudices and to integrate the Army more closely with civilian life by eliminating restrictions which made it an unpopular calling with a nation not intensely military in its outlook and opposed in principle to all forms of unnecessary controls. They underline the importance of the psychological as well as the practical approach to the building up of the Regular element of a modern democratic National Army.

Not the least contribution both to material and psychological well-being in the Army is the provision of equipment. The Secretary of State summarised the Government's policy in this way :

Our object in rearming is first to provide enough up-to-date equipment for current arrangements, which is quite considerable; secondly to provide balanced equipment for the Active Army, the Territorial Army and Anti-Aircraft Command; thirdly to provide Reserves for them; and fourthly to supply the Commonwealth nations and N.A.T.O. with the equipment necessary in maintaining their defences.

The Secretary of State has unfortunately retained one strange piece of nomenclature which really ought to be amended. By talking of the Active Army the inference is that the Territorial Army and Anti-Aircraft Command are inactive or have in some sort of way an inferior role to play. This is a bad impression to give and it is time to make a change.

Anti-Aircraft is indeed a sphere in which equipment policy requires to be examined. Not the least serious effects of the great post-war "run-down" was the deterioration in the anti-aircraft equipment position, due mainly to the lack of replacement of American radar equipment and the absence of any British counterpart, and secondly to the fact that a high proportion of anti-aircraft equipment was already obsolescent at the end of the last war.

The importance of "anti" weapons declines as victory rolls on, and one of the very real dangers at the present time is that too much planning should go on on the 1944-45 victory theme and not on the more realistic assumption that democratic forces are more likely to start at a certain disadvantage to the totalitarian machine, which has not had the incumbrance of an overriding peace economy to consider.

The increased speeds of aircraft, the use of guided missiles, the potential of atomic development are factors which tend to discredit much that was

effective in the 1939-45 anti-aircraft doctrine. Higher calibre weapons with greater accuracy are the requirement. Pin-point bombing is not the problem—high speeds cancel out the dangers of heavier and more destructive missiles. It is the rocket with the possibility of an atomic war-head that is the real potential enemy that has to be frustrated by anti-aircraft.

For that reason the Secretary of State's contention in debate that the justification of modern Ack Ack is prevention of aircraft flying low or having the necessary period for a steady run-up is a dangerous underestimate of the problem and its solution. At the moment the real answer to air attack is a policy of intense offensive defence which is within the competence of the R.A.F. alone aided by long-range radar detection. There is reason to believe that too much money in proportion to the overall expenditure is being spent on Ack Ack and also that the expenditure will not in fact produce the results.

The development of anti-tank weapons is of no less importance, and there did not appear to be that weight of emphasis on this matter in the debate. If it is not possible to have more tanks than the enemy, then it is essential not only to have better tanks but also the means of reducing the disparity.

In the matter of armour there is reason for more optimism than in previous years. In that field, however, the journey from the drawing-board to the field is a long one during which unforeseen counter-developments may well occur. Those who design our tanks must never be allowed to sit still. They must always have before their eyes the discouraging slogan: "Your newest tank is already out of date."

The .280 rifle has caused not a little controversy. It is now apparent that standardisation has won the day, and the Secretary of State's remarks on ammunition supply were very telling. At the same time, it would be a very dangerous policy to follow continuously. The rifle like all other weapons is capable of improvement, and the measure of such improvements can only be gauged by use over a period under active conditions in the field. That is now to be denied to the .280 rifle. The forces ranged against this British advance are formidable. Those who oppose it would, however, do well to reflect that quality can offset quantity. The only effective way of confronting the inexorable quantity of Soviet manpower without crippling self-sacrifice is by producing in every sphere greater power per man. The .280 rifle was a great contribution to that principle. Its rejection may mean the production of greater numbers of other arms made elsewhere, but it may also mean an ultimate increase in expenditure of blood from the same source. That is rather a high and unnecessary price to pay for professional pride and national bias.

The Secretary of State for War would show courage—and he has an abundant supply of it—if he were to press for the introduction of this rifle in certain restricted spheres, such as our airborne forces. He will certainly receive the support of many members on both sides of the House if he takes this line.

In airborne development there is not enough evidence of progress. Mobility by air in vast territories is an important characteristic to possess. Just as the mobile infantry and artillery became a feature of the last war, so we must be prepared to take more and more of our Army to battle by air. They cannot be trained for that, nor can the various administrative,

technical, and staff problems, nor in fact the operational problems either, be studied unless this method of travel is more common to more units. To-day the Secretary of State admits there are not enough aircraft for the purpose. That situation must be remedied.

During the debate on the Army Estimates a resolution was moved on the subject of training. The discussion which followed was mainly concerned with the training of the Territorial Army and of the National Serviceman and of the Z Reservist.

Mr. Hutchison summing up observed :

I think that Hon. Members will be satisfied that the role played by the Army and National Servicemen particularly in Korea bears evidence of the fact that our training programme has not been built on shifting sands.

That is undoubtedly true. Nevertheless, there is also evidence that in certain instances National Servicemen are not in fact coming out of the Army with the impression that their time was well or profitably spent either from their own point of view or from that of the nation. Those cases are in the minority, and in many of them the reason lies with the man and his capabilities and also in the inescapable fact that there are many unexciting but none the less necessary jobs to be done in the Army. There is sympathy for the National Serviceman who on being called up was asked what he would like to be and who replied, "I would like to be C.O." Unfortunately, or fortunately according to the angle of approach, such jobs are limited, and even in the Soviet Union there are more private soldiers than marshals. Nevertheless, it is true that some private soldiers are more private than others.

With more or less active conditions existing in so many theatres the training position is very different from what it was in the pre-1939 era. Realism is no longer the overriding problem. It is replaced by the far more responsible task of producing a high enough standard in a man before he is called to a place where he may be actively engaged.

The Rhine Army manœuvres last year, as in previous years, were attended by a delegation of M.Ps. No doubt the news of their coming was received with appropriate parliamentary sentiments. The experience from the point of view of the Members was undoubtedly beneficial whatever the strain on the morale of the troops. Most impressive was the unquestioned advance in all-round training standards since 1950. The summary of the Commander-in-Chief and the brilliant conclusions of the C.I.G.S. were in themselves worth a journey to the theatre and a source of great encouragement to the listeners. At the other end of the scale the spirit of the soldiers and the self-confidence of the junior commanders and N.C.Os' were a great tribute to the training methods of our Army.

THE RESERVE ARMY

In the discussion of the Army Estimates, emphasis was rightly centred on the development of the Regular element. It is no less important that that Regular centre should be capable of rapid and efficient expansion. That is the prime responsibility of the Territorial Army. That responsibility has been greatly increased both by the introduction of National Service and by the recall of the Z Reservist.

The nature of the Territorial Army has therefore altered since it was

reconstituted after the war. Its relationship to the Regular forces and its place in the system of national defence require to be more closely studied than heretofore.

Territorial units are no longer a military by-product. They are an essential part of the military machine. If they did not exist or failed to function efficiently, then the Army as a whole would be rendered powerless to meet quickly any emergency, and the efficiency of those who have received their initial training at the hands of the Regulars would be vitiated. That means that the Territorial Army must be taken seriously by the Regular Army and by those who join it, and by industry, from whom they are drawn. That calls for the proper training facilities in terms of instructors and equipment, a more stringent selection of officers and N.C.Os. in the T.A. itself, and the granting of every facility to Territorials by industry.

In the last case industrialists must realise that if they are not prepared to make a proper contribution to defence they may one day have nothing to be industrious about. If they complain about man-power and loss of man hours they should be reminded that if the voluntary machine is not enabled to function properly then there will have to be an extension of the compulsory principle.

In so far as the relations between the Territorial Army and the Regulars are concerned there is undoubtedly an improvement. There still seems to be room for the claims of the T.A. to be better represented to the National Serviceman when he is still with his Regular unit. Although the association between county regiments and their T.A. partners is firm, the same cannot be said in every case where the urban units are concerned. If the old system applied whereby the T.A. adjutant was a Regular much would be achieved in that direction, particularly if it were made clear to the officer concerned that his future would be radically affected by his performance with the Territorials. That matter has been raised in the House and will no doubt be raised again.

The T.A. to-day faces one crisis in the matter of senior N.C.Os. who are leaving after having completed their term and who are not being replaced. Their replacement can only come in the long run from those who join up after they have done their National Service. That is a situation that must be tackled by the T.A. in conjunction with the Regular Army.

During the year the question of compulsory holidays for the T.A. was discussed in the House of Commons. The advice of the Territorials was that this was not a wise step in view of the attitude of industry and of the Trade Unions. It is worth considering in the future whether it would not be wise to attempt to alter that attitude. While the average Territorial is ready to give up his time, it becomes an increasing sacrifice in the light of the very much heavier responsibilities involved in training the National Serviceman and in dealing with the Z call-up.

That is an operation which the present Government has decided to repeat. The Opposition has naturally had one or two sarcastic remarks to make in view of what was said by Conservative members when the scheme was originally introduced by the Socialist Government. The criticism is neither unnatural nor unreasonable.

The Z scheme is undoubtedly an imposition. Its introduction was

justified primarily on the grounds that it would create in the Army a sense of teamwork ; that it would give to those who were liable to call-up in the event of an emergency an indication of what they would have to do and where they would have to go.

In the light of the more critical situation confronting our armed forces last year that was an acceptable proposition. It was also a reasonable precaution to exercise the mobilisation machinery. This year, however, the situation justifies it less, and it is to be hoped that the justification will be further reduced in 1953. In the circumstances it is expected that the Government will make some statement with regard to their future intentions before long. A third Z call-up would tend to defeat its own object in the field of team-work, because there would be too many people in the same teams. It would therefore be a question of creating more teams which the establishment could not carry.

One serious failing in last year's Z call-up has been remedied. Men going to T.A. units are being taken from the area served by those units as far as possible. That means that T.A. recruitment has an additional source from which to draw. The Secretary of State has now announced that men called up last year and wishing to go to camp with the same units this year may volunteer to do so. The T.A. may thus be enabled to deal with its immediate N.C.O. shortage if sufficient of these volunteers can be persuaded to join.

At the present time there is some evidence that many of those called up are unlikely to be available owing to their civilian priority. This is a wasteful procedure which ought not to be perpetuated. It has been brought to the attention of the Ministers concerned.

The latest development connected with the Reserve Army is the resuscitation of the Home Guard. This was the subject of the first legislation to be brought before Parliament by the new Government. As a result it was made the occasion of an animated debate, an all-night sitting, some loss of temper, and a great deal of irrelevance in the form of a filibuster.

It now remains to be seen to what extent the Home Guard is able to make a contribution which will in fact relieve the other elements of the Army. To many it seems that the Home Guard organisation is not as closely related to the Territorial Army as it might be. The logical arrangement would appear to be that the Home Guard should act as a second-line Territorial Army ready to step into its peacetime stations on an emergency and so closely associated that Territorials coming to the end of their service would logically transfer to the Home Guard.

The possible role of the Home Guard in Ack Ack has not been exploited. There are reasons for this. Nevertheless, there are certain attractions and advantages in employing the Home Guard in that role which ought not to be lightly dismissed. There is the question of the Home Guard in a Civil Defence role, where some Home Guard duties are likely to overlap those of the C.D. organisation. There is in addition some ground for believing that the present assumption that the Army will be able to give considerable assistance to the Civil power in war is not warranted by the facts.

If the armies of Great Britain are deployed on the Continent, then it is highly improbable that there will be sufficient troops at home to operate in any kind of Civil Defence role. If, on the other hand, they are forced to operate in this country, then the state of affairs is liable to be such that

the whole of Civil Defence will be merged under military control. In either case that is not the basis upon which Civil Defence preparations are being made. Some further clarification seems to be needed.

THE INTERNATIONAL FRAMEWORK

We cannot afford to have any potential enemy in possession of the Channel ports. With the development of rocket missiles it is unlikely that we shall be able to tolerate an enemy on the Rhine. That makes the defence of Europe equivalent to the defence of Britain. For that reason if for no other we must ensure that Europe's defences are efficient. To-day they are still far from being in that satisfactory condition.

British Members of Parliament have recently visited S.H.A.P.E., where they were addressed by General Eisenhower himself, by Field-Marshal Montgomery, and by General Gruenther. Of all the contributions which are being made to European defence the most important single contribution is the mind and personality of the great American General. His approaching disappearance from the military scene is an alarming prospect.

The decision of the former British Government not to allow British forces to be part of a European Army is undoubtedly sound in practice although it may well give cause to those who wish to doubt British intentions to put about false opinions. The British Army is part of the defence forces of the British Commonwealth and Empire. The European theatre, although of the utmost importance to Britain, is only one of the theatres in which British interests are concerned. No single element or elements of the British Army can ever be irrevocably detached from British command, nor can the British command, which has to consider a wider sphere than that of European operations, be surrendered to any supra-national authority with more limited frontiers. The Foreign Secretary and the Service Ministers are in agreement about that, and Mr. Churchill himself has sealed the policy.

Britain must be free to deploy her forces wherever the tension may be exerted by the Communist machine. In so doing she can render her best service to the defence of Europe. Nothing of that suggests that British units cannot and will not be placed under a unified European Command. But the creation of a European Army is primarily the concern of the nations of the European Continent. And one of those nations is Germany.

Without a strong Germany a Europe confronted by an aggressive power on the east cannot be strong enough to meet the challenge. In Germany itself, divided under the Potsdam Agreement, there is the most likely point at which the challenge will come. Eastern Germany is already in a state of para-military preparedness which renders her to all intents and purposes a Soviet satellite. If West Germany is to be defended it must be capable of self-defence. That means that there must be a Western German Army. That army must be part of the European Army, and Western Germany as a contributor must have equal rights with the other contributors.

That is a difficult policy for the Western Powers to accept. It is particularly so for France. There are many people in Britain who do not like it, and it is understandable that they should not. It is, however,

essential that the West should negotiate with the Soviet Union from strength. To try to do so without a measure of rearmament in Western Germany is to place an additional burden on British manpower and economy which it would not be possible to bear.

The British Army of the Rhine is aware of these considerations, and it will be upon them that the responsibility for the initial training and organisation of the West German contribution is likely to fall. In the light of 1914 and 1939 never has so great a personal responsibility before history fallen upon the shoulders of one single military element. Like the Eighth Army, they may well have it in them to change the future course of the world.

It is against this vast background of international and in particular of European rearmament that the measures that are being taken to build up the British Army must be considered. To judge the proposition merely in terms of British or even Commonwealth operations is to take up an absurdly parochial position.

A AND Q

In contrast, the House has considered during the year a number of domestic but none the less highly important aspects of Army organisation.

The one which has received most public attention has been the Army and Air Force Annual Bill. Discussion on this developed into an acrimonious struggle which threatened the business of the House of Commons with a deadlock. Many Members proved conclusively that the barrack-room lawyers could teach them nothing, and as a result the barrack-room lawyers if they choose to study the debate will have much to learn. As a more serious result the Secretary of State has agreed to a procedure which will involve the complete amendment of the Army and Air Force Act.

A development of greater importance has been the creation of new courts martial procedure involving a court of appeal. This was the result of recommendations made by the Lewis Committee; and the Bill, which was one of the last introduced by the Socialist Government, was generally welcomed on all sides of the House.

Steps are being taken to arrange for officers who had staff training during the last war, particularly those who went to Camberley to have refresher courses either as their Z call-up duties or as volunteers. This is a sensible arrangement, because many of these men are employed under circumstances which preclude them from joining the Territorial Army. Their services would, however, be highly necessary in the event of rapid expansion of formations on the approach of war. To make provision for the expansion of units without a comparable development of the staff is to ensure that initial staff-work will be inefficient. Rapidly assembled staffs will be liable to consist of persons not considered essential to their units for reasons which are not given on their recommendations for staff employment but which are subsequently only too obvious. The only drawback about the present arrangements is that such ex-staff officers are inevitably lacking in experience in the field with modern units, which is liable to be a dangerous handicap.

The House has been pleased to learn of the good standards of discipline prevailing in the Army. There have been some notable exceptions

concerned with Korea, and the question of orders to sentries has been discussed. Members whose constituents have been killed or who have died in other theatres have on occasions been confronted with the request by parents that the bodies should be brought home. The policy of the late Government that this expense could not be borne by the public and that the parents could pay, at a reduced rate, for the return of the body, has been upheld by the present administration.

The Secretary of State for War in his Memorandum on the Army Estimates has indicated the Government's works policy for the Army in these words :

Our main effort will be devoted to the extension of our anti-aircraft defences and to the provision of storage for vehicles, weapons, and other equipment which will be produced under the rearmament programme.

It is to be hoped that in the planning of these Ack Ack works full consideration is being paid to the changing character of air attack. It would indeed be foolish to invest heavily in structures that might soon be out of date. Many people think that the anti-aircraft defence of the future should be more mobile and that the main development should be to produce the same accuracy and precision in mobile that to-day exists in static equipment.

In the same Memorandum there is reference to the highly important question of movement. The present Secretary of State will no doubt take a great personal interest in this as his thesis on the subject of "manpower in the pipeline" was one of the features of his speeches in opposition. It is encouraging to note that he intends to make greater use of air transport. Those who have had to endure troopship conditions, which have also been the occasion of discussion in the House, will be glad to note that that matter is receiving high-level attention.

There is one final matter which is causing concern to Members, namely the housing of soldiers coming out of the forces and of the families of soldiers who die or are killed. People in both these categories have no strong housing claim on local authorities compared with those whose civilian employment has meant that they have been on the various housing lists for great lengths of time. Although in principle local authorities take cognisance of this fact, the regulations for "forces category" are not uniform, nor are they particularly favourable in many cases to the Service family. This is a battle which must be fought out by individual Members in their own constituencies with their own local authorities. It is also a matter which requires a still stronger piece of advice to local authorities from the Minister of Local Government prompted by the Minister of Defence. There could be no greater discouragement to recruiting than to have such a disability lurking in the background.

Finally, on that issue it is interesting to note that the Minister is making arrangements to place recruiting under the control of a major-general, and that he has also called in to advise on the kindred operation of publicity Mr. Sidney Rogerson of I.C.I. Mr. Rogerson's reputation in the world of publicity stands very high, and it is to be hoped that he will transmit that attribute to the recruiting figures. In both these appointments the Secretary of State has shown yet another indication of that vision which characterises his parliamentary achievement.

SUMMARY

At no time in our peacetime history has so much money been devoted to our Army. That is a fact which read against the economic background demands that Parliament should ensure that it is well spent. The implications of that both from the point of view of the Government and of the Army are obvious. On all sides there must be the utmost vigilance.

Neither manpower nor money must be wasted. In order to meet the potential threat of aggression it is necessary to negotiate from strength. For a nation of our size and economic potentiality that means that our Army must produce maximum power per man, which can only come from increased mobility, fire-power, and efficiency. Without imaginative and accurate planning by the Government the Army cannot be expected to produce the results. There is evidence that the Government, and in particular the Minister concerned, together with his advisers, understand their responsibility.

As for the Army, the record speaks for itself. The Secretary of State for War has also spoken. His words are endorsed by the vast majority of a House of Commons which cannot at this time be regarded as being particularly harmonious on other issues :

I believe all Hon. Members of the House will agree with me that all these men of the British Army, many of them parted from their wives and children, many of them conscripted against their wishes, many of them in danger and discomfort all over the world have done their duty in a way which deserves the admiration and the gratitude of this House.

IAN HARVEY

CHAPTER XIX

OPERATIONS IN MALAYA

I. BACKGROUND

THE KEY to the present situation in Malaya lies in the past, in its geography, its people, and its economy. Without some knowledge of these subjects it is extremely difficult to appreciate the problem which now confronts the British Government in Malaya.

Malaya is a comparatively small country of about 50,000 square miles of which nearly four-fifths is covered in dense tropical jungle, much of which lies in mountainous or hilly ridges. It is a land of continual rain and sun; consequently the vegetation is lush and the climate is humid, which make operations difficult and exhausting. In the developed areas road communications are good and compare favourably with those of neighbouring countries and our other colonial possessions. Movement off the road, however, is difficult and extremely tiring. The jungle is passable on foot, though a matchette often has to be used to clear a path. In the rubber plantations visibility is fairly good except where they have been neglected and have become overgrown. There are also considerable areas of swamps covered with mangroves, and the paddy fields in the wet weather form yet another obstacle. The infantryman's life is therefore hard, with plenty of sweat and tears.

The inhabitants of Malaya are as varied as the terrain. In the past the aborigines, known as the Sakai, were driven by the Malays into the jungle, where they lived by hunting with primitive blow-pipes and by cultivating tapioca in small clearings. They are the only real inhabitants of the jungle and they can exist where other races would perish. They are extremely primitive, simple, and unclean; their traditional enemies are the Malays, and they are therefore friendly with the Chinese.

The Malays are a charming, picturesque, and intelligent people but lack the drive and vitality of the Chinese. They are still a feudal race and are governed, under British direction, by their own sultans. The majority are zealous Moslems, and if their religious feelings are aroused they become fanatical and violent; the riots in Singapore during December, 1950, illustrate this tendency. The Malays provide the aristocracy of Malaya, and their sultans are the bulwark of conservatism in the land. The Malays are only now becoming politically conscious and have now produced a popular leader, Dato On, an astute politician with a good brain. The majority of Malays are anxious to organise themselves into a political community in order to protect themselves from the economic pressure of the Chinese. Dato On, however, goes further than this, and he wishes to weld all the Asian races in Malaya into one self-governing community. These views have aroused the hostility of the land-owning sultans. There are approximately 2,700,000 Malays in the Federation and Singapore and they form less than 50 per cent. of the total population.

The Chinese, like the British, are aliens and came to Malaya to provide the labour for the tin mines and the plantations, as the idle and fastidious

Malays would not do this sort of work. They also came as traders, and now a very large percentage of the wealth of Malaya is in their hands. The Chinese are firmly implanted in big business; they provide the bulk of the artisans and own most of the small businesses and shops. As a race they lack civic consciousness and for centuries have been subjected to "squeeze" in their homeland. Therefore, in spite of their many other admirable qualities, they are not emotionally suited to stand up against terrorism and intimidation.

The Chinese themselves are divided into two distinct communities. About 55 per cent. of them are born and bred in Malaya and are known as "Straits" Chinese. These have identified themselves with the country, and their ties with China are mainly sentimental. The remainder are "foreigners," *i.e.* aliens from China who have come to Malaya to make money but not to settle. It is from this category that the bulk of the Communists in Malaya come, and many of these Chinese, though not active supporters of Communism, are passive sympathisers. The alien Chinese are on the whole poor, and the wealth of the Chinese community is centred in the old families of the "Straits" Chinese. There are about 2½ million Chinese in Malaya, and the bulk of these are to be found in Singapore and in the western maritime plain.

A large number of the coolies employed in the plantations are Tamils. These are simple and comparatively primitive people who were imported from Southern India as labour. In Malaya they have enjoyed a higher standard of living than they could find in their native country and are now becoming politically conscious. On the whole, they are a peaceable people, occasionally prone to moments of extreme religious excitement, and contribute only in a small way to Malayan Communism. They are better politicians than they are fighters.

The smallest, the most important, and the wealthiest community are the Europeans, of which the British provide the majority. All is, however, not well with them; the tin miners and the planters have now had to endure three years of emergency under conditions of isolation and danger. Their nerves are beginning to fray. Many Europeans were prisoners of war under the Japanese and many are still looking over their shoulder. If internal conditions do not improve and the situation in South-East Asia deteriorates further, the Europeans may prove to be the weak link in the chain.

The majority of all these people live and work in Malaya for one of three reasons—rubber, tin, or Singapore. Malaya produces nearly half the world's natural rubber and more than one-third of its tin. Singapore is now one of the greatest ports in the world and is the centre of the entrepôt trade of the Far East. It is also a focal centre for sea and air communications and is admirably served with a first-class harbour and airport. Malaya and Singapore form the largest dollar-earning area of the Commonwealth and would be a rich prize for covetous hands. Their prosperity depends on an adequate supply of capital, skilful management, and good and plentiful labour. It is upon the last that the full weight of the Communist attack has been brought to bear.

Communism is nothing new in Malaya. The Malayan Communist Party (M.C.P.) was formed in 1926 and was a source of embarrassment and irritation to the Government before World War II. It tried to gain

control of the labour movement in Malaya, and its activities were of such a subversive nature that it was outlawed and driven underground. When the war started the M.C.P., as a faithful satellite to Moscow, claimed that the war was imperialist, and it remained hostile to the Government. The attack on Russia and the entry of Japan into the war changed this tune, and the M.C.P. decided to co-operate with the Malayan Government against Fascism. Malaya was overrun and before final surrender occurred an underground movement was started in order to attack the Japanese during the occupation. The majority of these underground cells were formed by the M.C.P. in collaboration with the Government.

After the liberation of Malaya the M.C.P. attempted to gain its ends by political means. Underground cells were formed, disguised as Ex-Comrades Association of the Peoples Anti-Japanese Army, and intense infiltration took place in the trades union movements in Singapore and the Federation. The rapid economic recovery and the growing prosperity of the country, however, did not provide a fruitful soil for Communism, and it soon became clear to the Central Executive Committee of the M.C.P. that political and constitutional methods would not yield satisfactory results. Therefore in 1947 the decision was taken to resort to force of arms. It is significant that this decision was made outside Malaya at an International Communist meeting in Calcutta.

The plan was clear-cut and simple and the object, *i.e.* Communist control of Malaya—was to be achieved in three phases:

- I. Sabotage, murder, and arson leading to wide-scale labour trouble and economic chaos.
- II. The "liberation" of isolated areas by the Communist armed forces.
- III. Linking up the "liberated" areas until the Europeans were driven from the country and Communist rule established.

It is most important to remember that these phases are still the aim of the M.C.P. Fortunately, they have not passed beyond Phase I, though occasionally very isolated areas of the jungle have come under Communist domination for limited periods.

In July, 1948, the M.C.P. tried to stage a general strike in Singapore, but for some reason their efforts were unco-ordinated and the attempt failed. The Communist leaders went underground and fled to the jungle of the Federation.

Since then the struggle has followed this sequence:

- (a) Sabotage, ambush, and arson by the Communists, mainly directed against Europeans. In consequence the security forces of the Government were dispersed in order to provide protection to civilians.
- (b) Continued and somewhat unco-ordinated attacks by the Communists, with Asians, both Chinese and Malays, often the victims. During this period the police force was increased substantially, special constables were recruited in order to provide static protection to the rubber estates and the tin mines, and the military forces were substantially reinforced from outside the country.

- (c) During the next stage the Communist tactics did not vary materially. The Government forces were able to switch to the offensive, but the efforts were not integrated and there was a tendency for the civil administrations to dismiss the "emergency" from their minds as a responsibility of the police and the soldiers. The military operations were remarkable for the gradiloquence of their titles and the largeness of their scale, but they did not achieve their object.
- (d) Murder, arson, sabotage, and ambush continued, and though Communists were killed in increasing numbers more recruits filled their places and there appeared to be no lack of arms or ammunition. Public opinion in Malaya was becoming increasingly disquieted at the lack of success, and in deference to this opinion a Director of Operations, Lieut.-General Sir Harold Briggs, was appointed.
- (e) The Briggs period produced some substantial successes, which, however, unfortunately were to an extent offset by several severe setbacks. The main achievement of the Briggs period was the realisation by the Government that the problem was not primarily a military one, and at last some degree of integration was achieved between the civil authorities, the police, and the military. The essential features of the Briggs plan was the resettlement of the squatters and the attempt to deny food to the Communists.
- (f) We have now reached the Templer period. It is too early to say what are to be the salient features of this phase. It is clear, however, there is to be a fresh approach, a new drive, and a subordination of non-essentials in order to achieve the vital task of crushing Communism in Malaya.

II. COMMUNIST ORGANISATION

It is a matter of taste whether the enemy in Malaya is described as bandits, Communists, or insurgents. Whichever title is selected, it should not indicate any lack of appreciation regarding their thorough organisation or skilful direction, which follows a typical Communist pattern.

The organisation is divided into three main parts :

The Malayan Communist Party

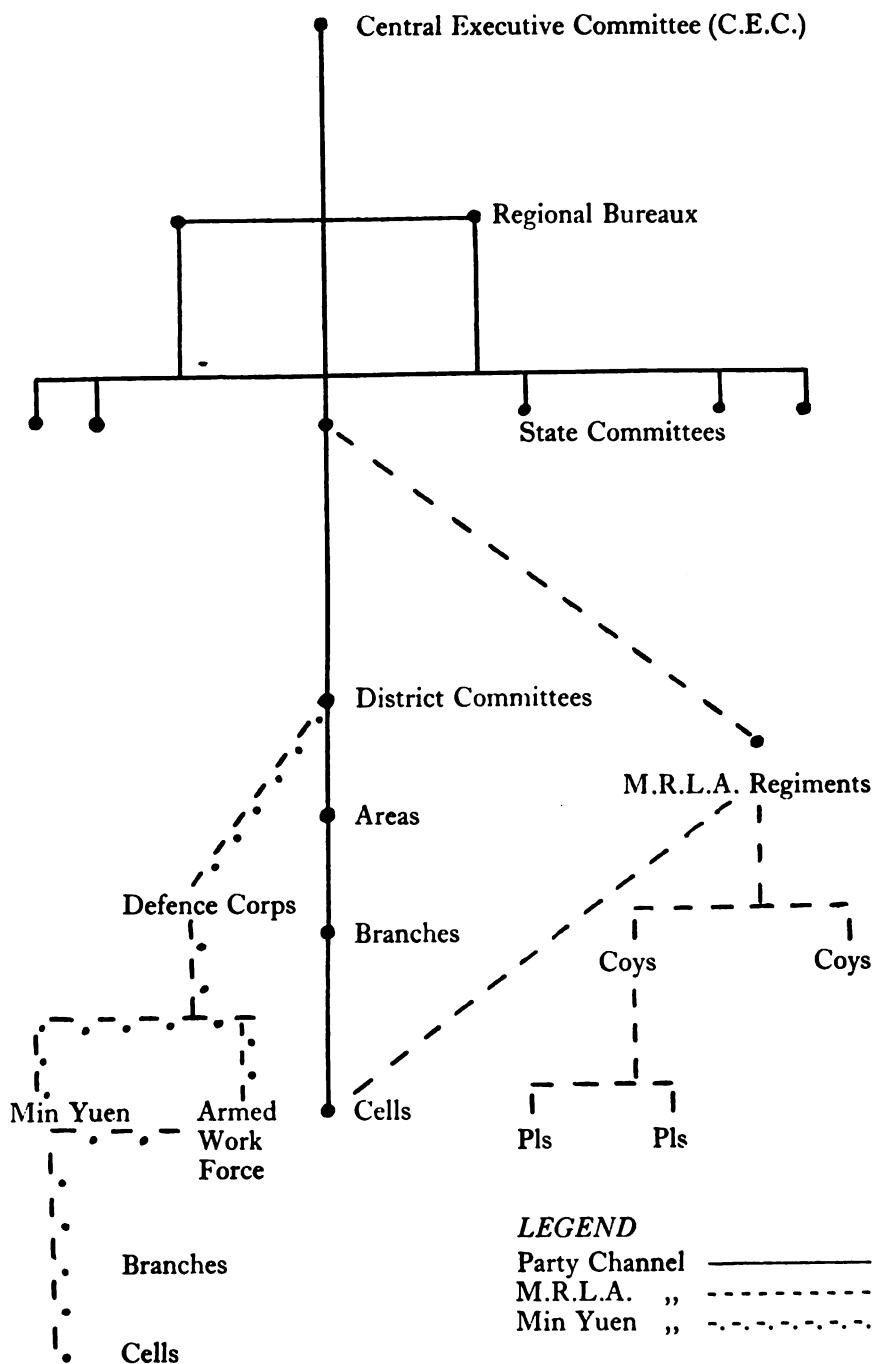
The Malayan Races Liberation Army (M.R.L.A.)

The Min Yuen (a form of fifth column).

The Party, which is in the main Chinese, probably numbers a little over 2,000, and the M.R.L.A. has a varying strength of about 4,000. The Min Yuen, which has all the characteristics of a Chinese secret society, can be found in every part of the Chinese communities, and includes members of varying degrees of dependability. It is most difficult to assess its strength, but its fully indoctrinated membership is probably not less than 10,000.

A simple diagram (page 212) probably illustrates best the relationship between the three parts of the Communist set-up.

Central Executive Committee (C.E.C.).—This consists of about fourteen members the majority of whom are known to the police but whose location is still a mystery. The C.E.C. is not directly controlled by Moscow



or Peking, but it follows the party line and its individual members maintain close contact with the Party in China. The C.E.C. exercises control over the Communist movement by directives carried by couriers. This method of control is effective but slow, and the lack of wireless and other signal facilities means that reaction to events is often delayed. The C.E.C. rarely meets more than once a year and its powers are usually exercised by the Secretary General.

Regional Bureaux.—These have no executive powers and are really communication centres.

State Committees.—There is one of these to each state except Kelantan, and Kedah and Penang are controlled by one committee. The members are representatives of the M.R.L.A. and district representatives who are known as "controlling figures." The Min Yuen has no direct contact with State Committees. Though the State Committees control the Party, M.R.L.A., and Min Yuen, the lack of communications imposes a wide rather than a detailed direction.

M.R.L.A.—Before examining the District Committees who really fight the war, the M.R.L.A. position in the Communist set-up must be understood. In theory there is an overall military command, but in fact this is unnecessary as the regiments act under political direction.

In military parlance they could be described as under command of State Committees and in support of District Committees. There are twelve regiments of varying strength, the maximum being about 500. They are loosely organised into companies and platoons. They are adequately armed with small arms, mostly provided during the war from British and Japanese sources, but are short of automatic weapons and lack mortars and artillery. Their standard of training and fighting qualities vary with regiments, and though they are skilled in concealment and jungle movement they have not displayed outstanding courage or skill in battle. As guerillas they wisely choose soft targets. They have survived four years of battle because the terrain is on their side, their intelligence organisation is superior to that of the security forces, and their recruiting system provides sufficient replacements.

District Committees.—These Committees consist of representatives of the Party, M.R.L.A., and the Min Yuen. It is here that the chain of command divides. One is a party organisation which stretches its way down to the individual cells. The non-party organisation starts at the Defence Corps, consisting of detachments known as Armed Work Force, recruited for defence purposes from the M.R.L.A. Then comes the Min Yuen, which can best be translated as the People's Army. The cell leaders are known as "the executives of the masses," and they control a variety of organisations such as the Childrens' Corps, Students' Union, Anti-British Alliance, etc. Members of the Min Yuen who particularly distinguish themselves as thugs probably join the Self-Protection Corps, which is the corps élite of the Min Yuen.

The strength of the Communist organisation is its wide distribution, and that though State and District Committees are part of the Party they are also firmly established in their own areas. This is also a potential weakness, as the destruction of these committees would lead to the collapse of the Min Yuen and the decline of M.R.L.A., which could no longer obtain supplies or information.

III. COMMUNIST METHODS AND TACTICS

The control of the masses, which is to be achieved by propaganda and intimidation.

The disruption of the economy of the country.

Armed attacks on the security forces.

Control of the Masses.—The tools employed for this task are the Min Yuen and the Defence Corps. The Min Yuen have infiltrated themselves into every part of the Chinese community, also among the Indians, and to a considerably less extent among the Malays. There is at least one Min Yuen cell in every plantation and tin mine in Malaya.

Their propaganda is skilful, continuous, and widespread. Where there is resistance to propaganda violence is used, and "running dogs" and "fascists" are murdered and tortured by the Armed Work Force or the Self-Protection Corps.

The part of the community most vulnerable to these attacks was the squatters. These are entirely alien Chinese and their form of life is a relic of the Japanese occupation. As food and employment became scarce under Japanese rule, many tappers and tin miners moved to the jungle edge, where they grew their own crops and lived under primitive conditions, without any social amenities, municipal organisation, or police protection. They had no legal right to the land, but after the liberation the Government made no attempt to resettle them. Farming then became a part-time business and their main occupations were rubber and tin mining. In view of the isolation of their position and the squalor of their existence they provided a fruitful soil for Communism, either by propaganda or intimidation.

The Disruption of the Economy of the Country.—Once again the Min Yuen and the Defence Corps are mainly used for this work, which is easily extended from their activities in controlling the masses. Favourite methods are slashing of rubber trees, arson of estate and mine buildings, railway and road ambushes, and intimidation of labour. As many of the Min Yuen are also tappers, the slashing of rubber trees is done with professional skill at the cost of thousands of dollars. Most of these activities are mainly irritants, though their effect is cumulative. Intimidation of labour is, however, a very much more serious matter, and the Communists have recently used it very successfully in two areas. In both cases the Communists achieved tangible results, *i.e.* loss of morale in the country as a whole, loss of invaluable U.S. dollars, and the dispersion of the security forces. Unless the Government can deal more effectively with this menace it is not impossible that the rubber industry may be brought to a standstill in many parts of Malaya.

Armed Attacks on the Security Forces.—These are carried out for a variety of motives and involve the Defence Corps and the M.R.L.A. Though attempts have been made to use these attacks for "liberating" selected areas, they are generally used for more immediate and pressing reasons. The favourite is probably to obtain arms and ammunition, and the easiest targets are the special constables on isolated estates. From the Communist point of view this is a fruitful operation, as the morale of the special constables is lowered—and on future occasions the same results are obtained for a small financial consideration instead of a battle.

Another object that the Communists hope to achieve by these attacks is to lower the prestige of the Government and the morale of the local inhabitants.

The M.R.L.A. are unlikely to achieve success in these operations unless they are provided with secure bases, money, food, and good intelligence which will enable them to move safely in the jungle and achieve surprise. These necessary concomitants to success are provided by the Min Yuen. When a unit of the M.R.L.A. arrives in a new area it is met by guides, who take it to a prepared camp along a jungle track. Here food is waiting and probably a limited amount of money to pay the soldiers. The food and money have been obtained by subscriptions from the local tappers and tin miners—nominally voluntarily, but woe betide the tapper who fails to pay his subscription. The camp is skilfully constructed in dense jungle or swamp, hidden from the watchful eyes of the R.A.F., and consists of a series of "bashas," *i.e.* huts constructed of bamboo and roofed with atap palm leaves. Accurate information regarding the movements of the security forces is available for the military commander, and the few tracks leading to the camp are carefully watched by sentries provided from the Defence Corps or the Self-Protection Corps. The organising brain behind all this is the local District Committee and its agent is the Min Yuen. The situation is not always as idyllic as depicted here, as the activities of the security forces often lead to hurried departures from camps and days of hunger and fatigue.

This brief review of the enemy methods should make it abundantly clear that the really important parts of the Communist organisation are the State and District Committees and the Min Yuen. The destruction of the armed units is like killing flies with a Flit gun and a swat. By these methods the number may be kept under control, but unless the breeding ground in the dung heap is found and destroyed the plague will continue.

IV. THE MEANS OF A SOLUTION

In simple terms the object of the Federation Government must be the restoration of law and order in Malaya. To do this three things are required; the elimination of armed insurrection, the maintenance of economic production, and the political welding of the three racial communities into one nation. Where there has been dispute in the past is the allotment of priorities to these aims. There are many who argue that until armed insurrection is eliminated there can be no political progress, but this can equally well be answered by saying that the armed insurrection will continue until there is some political progress and the various communities stand solidly behind the Government. The trinity which tries to achieve this object consists of the civil government, the police, and the armed forces.

Civil Government

The operations in Malaya are classified as duties in aid of the civil power, and therefore the direction is the responsibility of the civil government. This direction is now centred in the hands of the High Commissioner who, advised by his Executive Council (which now includes the old War Cabinet) through his Director of Operations, will issue instructions to the

State War Executive Committees. On the civil side these committees and the District War Executive Committees are responsible for resettlement, emergency regulations, and propaganda. Most important of these is probably resettlement, which is an attempt to remove the squatters from the jungle edges and put them in more central areas where they can be adequately protected, suitably housed, and provided with reasonable social and civil amenities. There are still many squatters to be resettled and only about 70 per cent. have been moved; it is therefore a problem of some magnitude. As the squatter population provides the Communists with their main source of food, money, recruits, and information, the solution of this problem is of the first importance. Once the squatters are concentrated and resettled, the Communists will have great difficulty in obtaining their supplies and their channels of approach will be narrowed, thereby facilitating the chances of interception by the security forces.

Emergency regulations provide the legal authority for waging war against the Communists with other weapons than rifles and bombs. They are added to from time to time and now comprise an imposing total, which deals with such things as :

- Imposition of curfews.
- Defining protected areas.
- Taking possession of land and buildings.
- Orders for detaining or banishment.
- Closing of shops.
- Restrictions on movement of food.

In a country like Malaya where a large percentage of the inhabitants are illiterate the spoken word is more effective propaganda than the written one. Communist propaganda has been better than the Government's, though in the last year the latter has improved. This part of the civil government's activities is still probably the least satisfactory, but the task confronting its propagandists is formidable.

The Police

Since the emergency started the police have laboured under a series of grave disadvantages amidst a crescendo of hostile criticism. Their main problem has been one of expansion and a change of role for a very large part of the force. Probably their most serious disability was the lack of an adequate C.I.D. at the outset. This was mainly due to the war and the total loss of all the pre-war C.I.D. records during the Japanese occupation. The main components of the present police force are :

Regular police, consisting of station police carrying out conventional police work, and police jungle companies, who are armed and operate in a quasi-military manner.

Auxiliary police—these are volunteers and are part-time.

Special constabulary—recruited as an emergency measure to provide static protection for the plantations and tin mines.

C.I.D., which should be the nerve centre of the force and provide the bulk of the information available to the security forces.

The novel features in this organisation are the jungle companies and the special constabulary. Up to the present these jungle companies operate

Operations in Malaya. The 7th Gurkha Rifles in action in the Jungle



under police control though they function as a military rather than a police unit. Owing to their rapid expansion and the lack of suitable junior leaders, their training has been of an indifferent quality with a consequent adverse effect upon their operational efficiency.

Special Constabulary

Though on many occasions special constables have fought with gallantry and distinction they are unfortunately more often a liability than an asset. This is mainly due to the lack of adequate leadership and training. Owing to the isolation of many of their locations and inadequate supervision many of them become venal and often supply ammunition to the Communists. Their lack of training makes them an easy target for a bandit ambush.

C.I.D.

This is the vital branch in the police and, as previously indicated, it started off the emergency under grave disadvantages. Several changes in direction and command have not subsequently greatly improved its efficiency. It would, however, be wrong to assume because immediate results are not forthcoming that the C.I.D. is completely inefficient. In order to obtain the information it needs, reliable agents must be carefully planted through the Communist organisation ; this is a long, wearisome, and discouraging business particularly in an Asiatic country. One can therefore only hope that this process is taking place and progress, though imperceptible, is being made.

The Armed Forces

It is on the Army that the main burden of the struggle falls. Combatant and auxiliary troops engaged in operations number approximately 35,000 and include the Gurkha Division and 18 Infantry Brigade. The organisation and command set up are briefly as follows :

C.-in-C. FARELF allots units to H.Q. Malaya, and is responsible for their administration, training and discipline though not for day to day operations.

The G.O.C. Malaya receives his operational directives from the Director of Operations, an appointment which is now combined with that of High Commissioner of the Federation, whose advisors are the Executive Council. The next level in the Army is that of the Sub-District, of which there are two, North and South Malaya. These two H.Qs. are for operational co-ordination rather than for detailed direction ; both H.Qs. have considerable administrative responsibilities. One important point to note is that there is no counterpart in the civil administration and the police at this level. It is at the state level where the real Combined H.Q. (State War Executive Committee) occurs. Here are the Brigade Commander, Chief Police Officer of the State, and the Menteri Besar (The Prime Minister of the State) and his British Advisor. This is the focal point in the state for all sources of intelligence and for joint planning. The directives to implement these plans flow out to the District War Executive Committees (D.W.E.C.). This committee consists of the Battalion Commander, the

Officer Superintending the Police Circle (O.S.P.C.), and the District or Executive Officer. The detailed planning takes place here, and in consequence this is the Committee which really fights the war, though the actual battles are usually those of a platoon.

A brief account of the pattern of operations at this level is therefore a general description of operations in Malaya. The District Officer will be keeping his finger on the pulse of civilian morale, will be keeping close contact with the leaders of the various committees and being tactful with the local planters; as they provide many of the targets for Communist attacks they are not unnaturally inclined to be fractious. He is also concerned in the progress of the squatter resettlement in his district. This may be the responsibility of the Resettlement Officer, but the District Officer must watch developments with a fatherly eye. Then he has to implement the directions of the D.W.E.C. regarding Emergency Regulations, one of the principal weapons of the civil administration. On top of all this he takes his part in all the meetings of the D.W.E.C.

The O.S.P.C. has in addition to all the normal duties of a police officer the responsibility of obtaining operational intelligence, though in this he is assisted by his C.I.D. representative. Furthermore, he has to command the Jungle Companies in his circle and co-ordinate their operational activity. Many of these police officers have no military experience, and this control could be better exercised by the Battalion Commander. It is upon the latter that the main responsibility for the conduct of operations within the district must inevitably fall. With the intelligence provided by his colleagues, he makes the key plan, and issues the detailed orders for operations. From the start of the plan until its final execution the closest co-operation must take place with his civil confrères. The approach to any problem by persons of such different outlook and tradition must obviously vary. In order, therefore, to achieve his aim the Battalion Commander must display considerable tact, and on all sides there has to be some give and take. Inevitably the plan must follow a broad pattern, as it is always related to one essential—food.

Except when cultivated by the Sakai, little food can be found in the jungle. The bandits therefore must come into the food areas, and it is the object of the security forces to prevent this or to intercept the enemy as he moves in to gather his food. This is done by means of patrols and ambushes. The patrols are normally of section strength and move along the tracks in three groups—reconnaissance, rifle, and Bren. A patrol may stay out for 12 hours to 6 days; if over 24 hours it probably operates from a patrol base in the jungle. It carries a heterogeneous collection of weapons including the No. 5 rifle, the American carbine, the Bren, the Owen gun, and the Sten. The detailed allocation of these weapons depends on the taste of the unit commander. The Sten is unpopular and is usually relegated to the unfortunate administrative troops and the drivers. The British troops, particularly the National Servicemen, adapt themselves quickly to jungle conditions, and though their movement is more noisy than that of the Gurkhas or the Malays, there is little wrong with their stamina or guts. In order to assist British troops in tracking the bandits Ibans from North Borneo are attached to British battalions. Primitive people, descended from head-hunters, they are at home in the jungle and read it like a book. Though neither side can speak a word of

each other's language, the British soldier and the Iban are close friends ; this is probably based on mutual respect.

Patrolling in the jungle is wearisome and nervy work. By 8 a.m. the temperature is hot and sticky. The track is narrow and at times non-existent. Prickly creepers tear the jungle green drill and scratch the face. Sweat pours down the back, and clothes are soon wet and clammy. The going is seldom on the level, and the patrol has to scramble over slimy rocks where the rubber patrol-boots are a menace and may easily lead to a broken limb. There is an eerie silence interrupted by a series of jungle noises which always sound hostile. As the day goes on the ten-minute hourly halt seems never to take place and one's alertness is deadened by growing weariness. All the time the leading scout feels as if he is being observed by unseen and unfriendly eyes, and the sudden crack of a broken branch sounds like the first shot of the ambushers' volley. When contact with the enemy is made it is usually sharp and short ; a sudden flurry of shots, a quick flanking movement, and a charge. Then a long and wearisome pursuit following up the inevitable blood tracks ; sometimes this is delayed whilst the patrol tends its own wounded or carries away its dead.

An ambush is less exhausting but infinitely more tedious. Skilfully hidden, the ambush lies and watches the track along which the bandits are expected to move. Many ambushes are carried out at night, and there is an irresistible inclination to go to sleep. However, the mosquitoes and the leeches do their best to prevent this and yawning is mingled with scratching. The nerves are keyed up and every sound is suspect. As the night drags on, the senses become dulled and the trigger-finger relaxes. Suddenly there are loud and unmistakable sounds of movement. The ambush commander fires his flare, and the Bren rips the silence apart. For half a minute there is a pandemonium of firing which ceases as suddenly as it began, and the ambush wait for the dawn to show the result. As it gets light the victim is discovered, lying in a pool of blood—a very dead wild pig !

The patrols and the ambushes described above are carried out usually as a result of rather limited information or on no direct information but as a result of intelligent anticipation by the Battalion Commander. Occasionally the public or the C.I.D. provide a piece of information which is graded as red-hot. Then speed and surprise are essential. A quick plan must be made, the suspected areas sealed off, and the beaters put in to flush the game. Here the analogy ceases, as it is often the game that fires first. The range is so short that a miss is unlikely, and the first casualty is probably a young soldier. Nothing daunted, the remainder push on and the bandits are flushed with 2-inch mortar bombs, grenades, and flame throwers. Ultimately they bolt and run into the stops, where they are killed.

The M.R.L.A. have so far avoided total destruction because the jungle enables them to fade away when attacked and does not permit the maximum use of the fire power which the security forces possess. However, the Army is making increasing use of the 3-inch mortar and 25-pounder. As the exact location of the enemy is seldom known, these weapons are not used so much for their lethal as for their harassing effect. Suspected lying-up areas and bandit tracks are intermittently bombarded, and fire power is used instead of manpower to restrict the enemy's movements.

The limiting factors with these weapons are the short range of the 3-inch mortar and difficulty in finding suitable gun positions for the 25-pounder; tall trees and hills have a very restricting influence in this respect. There is probably scope for a 4·2-inch mortar and 5·5-inch medium gun in these jungle operations.

The R.A.F. with bomb, rocket, and cannon provide the Army with additional fire power and are employed in a somewhat similar manner as the artillery. Their morale effect is probably greater, but owing to the difficulty in identifying targets surprise is seldom achieved and the lethal effect of aerial weapons is not great. Some pessimistic statistician has worked out that a bandit killed by the R.A.F. costs in cash the equivalent of a new heavy bomber. The R.A.F., however, provides other invaluable forms of support for the Army. The supply-dropping by the Dakotas enables the Army patrols to remain out in the jungle for weeks at a time. The skill of the pilots in dropping their loads in small D.Z.s. only a few yards long is astounding. Skilful navigation is also required to locate the pocket handkerchief of a dropping zone (D.Z.) in the dark green jungle. As the plane is heard the ground patrol light a smoke signal, the aircraft switches its wireless set over to the frequency of the patrol, and it is "talked in" to the D.Z. It is remarkable how few loads are lost.

The R.A.F. helicopter has transformed the system of casualty evacuation. In the past it sometimes took a week to carry a wounded man out of the jungle on the shoulders of his comrades; his chances of survival were small. Furthermore, this had a tendency to increase the size of patrols so that there were always sufficient to handle a stretcher case. Nowadays only a small clearing is required, wireless contact with the base is established, and in little more than an hour a helicopter has arrived. The helicopter is a life-saver and consequently a great morale booster. As helicopters increase in size they will become important tactically.

The first airborne operation was recently staged in Malaya when S.S.A. troops of the Malayan Scouts were dropped by parachute into a remote area of Pahang. From all accounts only a limited tactical success was achieved; this is not surprising. The use of airborne troops has often been considered in the past but discarded because the equipment was not available; secondly, the casualty rate amongst the trees was likely to be high; and thirdly, it was feared that by the time the airborne troops had concentrated on the ground the enemy would have fled. The first two difficulties appear to have been overcome, but the last one remains. With a highly mobile enemy, who is well concealed and is only prepared to stand and fight on his own terms, a conventional assault by paratroopers is of little value. If, however, the operation is considered as a means of movement instead of tactical assault, it has a hopeful future. By this method it will be possible to transport troops in a few hours to a remote area which would take weeks of marching to reach on foot. Subsequent air maintenance would then enable the force to deny a recruiting and food area to battle-weary bandits.

CONCLUSIONS

In spite of all the arguments to the contrary, the problem of solving the emergency in Malaya is mainly a civil one; this fact was recognised by

General Templer in his recent directive. There has in the past been considerable agitation for the introduction of martial law in Malaya. Such attempts should be resisted, as they will merely overburden military administration without a comparable increase in efficiency; all the powers that are necessary to deal with the emergency can be obtained by means of Emergency Regulations. Probably the most important aspect of the civilian side of the struggle is the maintenance of morale. This is equally important in both the European and the Asiatic communities. It has been suggested previously that the European morale is somewhat brittle. Over sixty-five European planters, miners, or civilian officials have been murdered since the emergency started. Furthermore, many of the older members of the European community were prisoners in Japanese hands during the war, and they view with grave suspicion the spread of Communism in Asia. There is little doubt that if Viet Minh were to gain control in Indo-China and the emergency in Malaya were to continue, many of the Europeans would leave the country for good. This would have a catastrophic effect on the economic situation, as it would remove the bulk of the managerial class in the tin mines and the plantations. The maintenance of morale amongst the Asiatic workers is of equal importance. At the moment much of the labour in plantations in more isolated areas is being terrorised by the Communists, with the inevitable consequence of a fall in production.

It is easier to state a problem than to show a cure, though the situation could be improved by raising the standard of the special constables, thereby providing more efficient protection for the estates, and secondly, by improving the Government's propaganda. The propaganda must be directed so as to obtain the maximum information from the populace, which, in the long run, provides its own best form of defence.

The production of rubber and tin in Malaya is essential to the Commonwealth as it provides a large percentage of our dollar earnings. Therefore, however effectively the campaign in Malaya is conducted it will be of little avail if the country ceases to export rubber and tin. This is closely bound up with the maintenance of civilian morale, and the methods used to achieve this objective will affect the other.

The command and control must be streamlined even more. The appointment of a distinguished general as High Commissioner with a Colonial Office official as his Deputy is a step in the right direction. This process should, however, be carried down the chain of command, and can be done at district level by placing the Police Jungle Companies under the operational command of the Army. A sense of urgency must be introduced into the civil administration in the same manner that aircraft production is being tackled in the United Kingdom. Problems relating to the emergency must be given "super-priority," an unfortunate but descriptive term.

Up to the present the weakest link in the struggle against Communism has been the police force, and its weakness is mainly due to conditions outside the control of the Government or individuals. It is, in effect, inherent in the rapid and vast expansion that has taken place within the Federation police force during the last few years. It is unlikely that this expansion will go much further; therefore, the time for digestion has now come. This process should include the retirement of some of the senior police

officials who have been worn out in the struggle. A staggered withdrawal from operations and training of the Jungle Companies and special constables, and the strengthening, both in numbers and calibre, of the C.I.D. must take place now. None of the solutions proposed will produce immediate effects, but their long-term importance is beyond dispute.

It has been stated officially on several occasions that the military strength in Malaya does not require to be increased. It is, however, most undesirable that the present number of British battalions should continue to be locked up in the jungle. These jungle operations provide invaluable training in patrol work, raise the standard of junior leadership, and develop the guts, endurance, and individual skill of the soldier, but they are not training for modern war. Furthermore, the presence of these British battalions in Malaya unbalances the Army as a whole and removes part of the strategic reserve from its correct position. A step in the right direction has been taken by bringing the battalions of the K.A.R. from East Africa and a battalion from Fiji. This process, however, could go further, either by the formation of additional battalions of the Malay Regiment or by bringing other battalions from Africa. The limiting factor, other than the operational situation, in deciding on the number of battalions required is the question of refresher training. If operational efficiency in the jungle is to be maintained, battalions must be withdrawn for about two months every year for training, refitting, and relaxation. If this is not done they will become stale and efficiency will suffer.

There are many factors which contribute to the operational efficiency of a battalion in this campaign, but probably the most important is the intimate knowledge of its own area. This can only be achieved by keeping units permanently in one area. Obviously the density of troops in different parts of the country must vary from time to time in accordance with the local situation and the main plan. This could be achieved by the movement of companies who can be temporarily attached to other battalions. This has been done in the past, and British companies have been attached to Gurkha battalions and vice versa with complete success. It is the battalion H.Q. which is the vital centre for control, contact with the civil authorities, and the dissemination of intelligence. This H.Q. therefore should never be moved, unless for most exceptional circumstances.

On the whole battalions are well supplied with arms and equipment. It would help, however, if more American carbines could be provided. The Sten rightly or wrongly does not enjoy the confidence of the soldier, and the No. 5 rifle, though it has many sterling qualities, lacks the higher rate of fire which is so essential in jungle battle. As Malaya produces so many American dollars it is unfortunate that some of these could not be used for this purpose. It would also be nice to have some more armoured cars, but the supply of the wartime models has now run dry and the production of armoured plate for new cars must be set against the rearmament programme at home.

The constant interchange of personnel within a battalion does not contribute to its efficiency. Nothing can be done about the turnover of National Servicemen though the introduction of two-year service has given some relief in this respect. It is, however, the regulars that provide the key men of the battalion, and the continual movement of these men as

a result of the completion of their overseas tour is a source of embarrassment and irritation to the battalion commander. The introduction of the three-year unit tour for the R.A.C. and the Infantry is a big step forward in this direction as it will provide continuity within the battalion.

One point that is abundantly clear is that the Malayan problem will not be solved quickly. The Communists are employing guerilla methods with a modern technique assisted by all the well-known Communist methods of infiltration of the masses. This article has shown briefly some of the more important aspects of the present situation, enough to indicate their importance and the difficulty of their solution. There can, however, be no retreat; the battle must be fought to the end, the terrorists destroyed, and the Communist dogmas defeated. If this is not done we shall lose Malaya, and this loss would affect the life of every individual in the British Commonwealth.

I. L. WIGHT

CHAPTER XX

FOREIGN ARMIES

(TURKEY, SPAIN, AND SWITZERLAND)

NOTE. Details of the armies of all the great powers were included in the 1950 and 1951 editions. As no important changes have taken place since then, it would be redundant to repeat the descriptions. This issue of "Brassey's Annual" is therefore confined to summaries of the organisation and role of the armies of three of the smaller, but nevertheless important, European countries—Turkey, Spain, and Switzerland.—
EDITOR.

PART I

THE ARMY OF TURKEY

Historical Background

IT IS now nearly 30 years since the Turkish Army, as a whole, engaged in war. On September 9, 1922, the Greek forces, which had invaded Turkey-in-Asia two years before, were finally thrown back into the sea at Smyrna (Izmir); on July 24, 1923 the national independence thus gained by military prowess was diplomatically recognised in the Treaty of Lausanne; and finally on October 6, 1923 the Turkish Army triumphantly re-entered Constantinople (Istanbul). This War of Independence laid the foundations of the modern Turkish Army. In three eventful years a motley assortment of ill-equipped soldiery, discouraged by their defeat on the side of Germany in World War I, had been so reorganised and trained under the dynamic leadership of Mustafa Kemal Pasha as to emerge a redoubtable force of nine army corps with a total strength of approximately 300,000 men. This fine achievement continues to inspire the military morale of the Turks to-day.

Soon after the outbreak of World War II a Treaty of Alliance between Great Britain, France, and Turkey was signed in Ankara on October 19, 1939. It called *inter alia* for joint action by the three Powers should any of them be attacked in the Eastern Mediterranean; and, in addition, Great Britain and France undertook to provide the Turks with such military assistance and warlike stores as could be made available without prejudice to the active operations of the Allies. On February 23, 1945, Turkey announced that she would declare war on Germany with effect from March 1. The war in Europe did in fact end before the Turkish forces could go into action; nevertheless, by 1945 the strength of the Army had been increased to some 600,000 all ranks—exactly double its pre-war size.

On the outbreak of the Korean War both the principal political parties in Turkey warmly approved the resolution of the Security Council calling upon member states of the United Nations to assist South Korea against the Communist aggressors. Their support soon took a practical form;

and on July 25, 1950 it was announced that a Turkish brigade group, of some 4,500 all ranks, was to be sent to Korea. Under command of Brigadier-General Tahsun Yazici, this contingent lost no time in going into action. During the first Chinese counter-offensive in the winter of 1950 the Turks were heavily engaged; and, with outstanding courage and tenacity, they fought their way out of encirclement by superior enemy forces at a cost of more than 800 killed, wounded, and missing. The survivors of the first expeditionary force returned home on August 15, 1951, having shown the world that the fighting qualities inherent in the Anatolian peasantry have been in no way diminished by 30 years of peace: their places have been progressively taken by other Turkish officers and men in order to spread throughout the Army the benefits of battle experience under modern conditions. In fitting recognition of her services, Turkey was on October 5, 1951 elected to the Security Council of the United Nations Organisation, and on February 18, 1952 became a member of the North Atlantic Treaty Organisation.

The Command Structure

The present strength of the Turkish Army is somewhere in the neighbourhood of 300,000 all ranks and comprises about 20 infantry divisions, 6 armoured brigades, and 3 cavalry divisions, organised in corps under 3 Army commands. The manpower strengths of these various divisions are nearer to Russian than to British establishments. The present role of the Turkish Army is to defend the nation against external enemies and to assist, if necessary, in the maintenance of internal security.

The Commander-in-Chief of the Army-General Sükrü Kamatlı—is, together with the Commanders-in-Chief of the Naval and Air Forces, subordinate to the Chief of the General Staff, General Nuri Yamut. The C.G.S. in turn owes allegiance to the Minister of National Defence, Helusi Köymen, who presides over the Supreme Military Council. Members of this Council can be co-opted as necessary to the National Defence Council presided over by the Prime Minister, Adnan Menderes.

Recruiting

The present law of military service was first promulgated in December, 1937, and was more recently amended in January, 1945. It lays down that every male Turkish citizen, without exception, is liable between the ages of 20 and 45 for service in the armed forces. Normally service with the Colours lasts for two years, the remaining time being spent on the Reserve. In certain circumstances an individual may have his military service deferred; but it is seldom completely remitted, except on medical grounds. Military service is part and parcel of the national life; and this system produces a reserve of trained manpower, so that, in the event of general mobilisation, it would be theoretically possible for the Turks to put into the field an army of 2,000,000 men.

All conscripts who have graduated from *lycées* or from some higher educational establishment become Reserve officers: of the remainder, a certain number become junior N.C.O.s. during their Colour service, after initial training in Basic Training Units. The pay of conscript privates is less than one shilling per month during the first year, though it is doubled for the second year. The initial issue of uniform and boots must last the

full two years of Colour service or else be replaced on repayment by the individual concerned.

The Regular element in the Turkish Army consists of a hard core of officers, warrant officers, and N.C.Os. on long or short (four years) service engagements.

Organisation and Equipment

The *corps d'élite* of the Turkish Army is the infantry, which forms the bulk of its strength. The basic infantry weapons are small arms manufactured in Turkey itself from German prototypes, augmented by 81-mm. and 60-mm. mortars from Western sources. The infantrymen wear steel helmets and battledress of the familiar British pattern.

In the predominantly mountainous terrain, particularly in the frontier regions, heavy tanks would have but limited scope. The Turkish armoured corps is therefore equipped with light tanks of British origin and with American M-36 "tank destroyers" mounting 90-mm. guns. In order to improve the mobility of the Turkish Army, an intensive programme of road improvement and maintenance has lately been initiated. While this is taking effect, the Turks—like the Russians—still retain a few cavalry units for use on ground unsuitable for mechanised movement.

In the artillery the heavier guns and howitzers have mostly been provided from the United States. Certain divisional artillery pieces, searchlight equipment, and Bofors light anti-aircraft guns are of British origin.

Training

We have seen how British military stores and equipment were made available to Turkey during World War II. This assistance inevitably dwindled after 1945; but, as a result of the Truman Doctrine of 1947, military aid in more considerable proportions began in January, 1948, to be provided by the United States. American equipment for the Army has included tanks, anti-tank guns, machine guns, bazookas, radar, signals equipment, motor transport, and medical supplies.

Furthermore, two Western military missions have been established in Turkey—the Joint American Military Mission for Aid to Turkey (J.A.M.M.A.T.), headed by Major-General William H. Arnold, and the British Training Staff, Turkey (B.T.S.T.) under Brigadier C. R. A. Swynnerton, C.B., D.S.O., A.D.C. The task of these missions is to train the Turks to make effective use of the up-to-date weapons and equipment now being provided for them. To this end, British and American officers and N.C.Os. of all arms are attached in an advisory capacity to the various army schools where Turkish officers and N.C.Os. are trained. At the same time certain Turkish officers are sent to attend military courses in the United Kingdom, in the United States, and with the Allied Forces in Germany.

Value for War

There is no doubt of the individual hardihood and personal bravery of the Turkish soldier. His preference is for hand-to-hand fighting; and he possesses the military assets of all country folk who live close to the land—frugality, endurance, a natural aptitude for field craft, a feudal loyalty to

his leaders, and an intense patriotism which bodes ill for any invader of his country. But, conversely, he suffers from the defects of these very qualities. His peasant upbringing has implanted in him a distrust of new methods and left him devoid of technical experience; while his simple, unquestioning loyalty too often fosters a lack of initiative at low levels.

There is still a grave shortage of junior N.C.O.s. The High Command is, however, generally first-class: in particular General Nuri Yamut, the Chief of the General Staff, appears to be fully alive to the necessity for augmenting the fighting qualities of his soldiery by developing the skill needed to operate and maintain modern equipment and by inculcating the mental flexibility required to cope with the complexities of modern staff-work and administration. Much progress has been made, but there is no doubt that there are many shortcomings which cannot be remedied all at once. Nevertheless, no invader of Turkey will have an easy passage. The Turks will fight; and, day by day, the British and American missions are teaching them to fight more effectively.

PART II

THE ARMY OF SPAIN

History

The Spanish Army is proud of its history and traditions, which for the past five hundred years have been intimately linked with the colourful, and often tragic, story of the nation itself. The Army never forgets that it has proudly carried the red and gold banner of Spain into nearly every country in Western Europe and that at Baylen on July 19, 1808, it was the first to defeat a contingent of the French Empire and cause it to capitulate: in modern times it claims to have safeguarded its country from Communism. By force of circumstance as much by design the Army has long exerted a predominant influence upon the internal affairs of Spain. In the nineteenth century it took part in civil wars, upset governments, and banished or recalled kings. In the present century the withdrawal of military support forced into exile the late King Alfonso XIII on April 14, 1931; and, conversely, the Army overthrew the *régime* of the Second Republic whose policy it had opposed. It was this latter event which led to the outbreak of the Civil War on July 17, 1936.

For nearly three years the Civil War was fought with great brutality. At least one million persons were killed, the factories were idle and the land untended. Eventually in April, 1939, Generalissimo Franco emerged at the head of three victorious armies, totalling some 87 divisions, to become the *de facto* ruler of a country weary of bloodshed and economically destitute.

On the outbreak of World War II Spain's need for internal rehabilitation virtually precluded any policy other than that of neutrality. At first General Franco's sympathies were clearly with the Axis, for during the Civil War he had received active support from both Germany and

Italy, while the governments of Great Britain and France had declined to assist the Nationalist cause; moreover, the Spanish Army greatly admired the German military system, which it then regarded as invincible. The outbreak of war between Germany and Russia in June, 1941, afforded an admirable opportunity to combine aid for the Axis with a contribution to the crusade against Communism; so a force known as the "Blue Division," composed nominally of volunteers, was recruited and sent, under the command of Major-General Munoz Grandes, to the Eastern Front.

When in 1942 the tide of Hitler's success began to turn, General Franco's attitude towards the Allies slowly improved. He turned a blind eye at the concentration of shipping at Gibraltar before the invasion of French North Africa, nor would he allow Spanish airfields to be used by the Germans against General Eisenhower's forces during the subsequent operations; moreover, he withdrew the Blue Division from Russia. Nevertheless, at the end of the war, Spain was refused admission to the United Nations Organisation; and the Western bloc, though prepared to concede that the Spanish people are best suited by a *régime* more authoritarian than Western democracy, are still unwilling to accept certain features of General Franco's system of government—for example, the lack of individual security, the absence of any proper right of association, and the excessive power of the Army in civil affairs. From the strategic point of view, however, Spain's geographical position cannot be disregarded by the signatories of the North Atlantic Pact, which came into force on August 24, 1949. Next door to France—the strongest Continental member of N.A.T.O.—and to Portugal—Britain's oldest ally—Spanish territory comprises important sectors of the Atlantic and Mediterranean coastlines. Furthermore, General Franco, for his part, has no sympathy with Communist aggression, and would not be averse to accepting money and equipment from the West in order to improve the fighting efficiency of his Army, which would undoubtedly resist any Soviet invasion. We may therefore expect both sides to continue to pursue the question of a *rapprochement* between Spain and the West. The success of any negotiations will depend upon how far General Franco can be persuaded to make genuine concessions to democracy, and how far the West can urge such concessions without arousing the traditional Spanish resentment of foreign interference.

The High Command

In supreme command of the Spanish Army is the 60-year-old *El Caídillo* Francisco Franco y Bahamonde. In his capacity of Regent he is the Head of the State; he is also *Generalissimo*, with the rank of Captain-General which corresponds to that of Field-Marshal. He exercises his military authority through the Supreme General Staff which he created on August 30, 1939 on the model of the German *OKW*. This body now functions as the Ministry of Defence, and consists of representatives of the Army, Navy, and Air Force selected by *El Caídillo* himself. The Chief of the Supreme General Staff is General Juan Vigón. The day-to-day administration of the Army is carried out by the Ministry of the Army, under the 57-year-old Lieutenant-General Munoz Grandes, who commanded the Blue Division in Russia. Under the Ministry of the Army is

the Central General Staff, at the head of which is Lieutenant-General Fernando Barron. The roles of the Spanish Army in peace are to protect the homeland and its overseas possessions from external aggression, and to assist the civil power in maintaining law and order in these territories when called upon to do so.

Recruitment

The permissible total strength of the Spanish Army is published each year in the Army Estimates. The actual front-line strength is at present about 400,000 all ranks, including the Spanish Foreign Legion and the Colonial Troops known as *Regulares* and *Mehallas*. Reserves may total about one million, and include all men up to the age of 44 who have served with the Colours. In addition, there are two para-military forces, the *Guardia Civil* and the *Policia Armada y de Trafico*, who perform police and customs duties.

On August 21, 1940, military service was made compulsory. A conscript is called up at the age of 20. He now serves for 18 months with the Active Army, and thereafter completes on the Reserve his total liability of 24 years' service. Provision is made for exemption in the case of the physically unfit and of workers employed in certain reserved occupations. There are stern penalties for evasion of military service. In theory, two age-groups are called up each year.

In addition to conscription there is voluntary enlistment for three years, and this term may not be broken. Re-engagements are permitted for consecutive periods of two years. Candidates must be Spanish citizens between the ages of 18 and 30 who are unmarried or widowers without children. They are allowed to choose the arm and corps in which they will serve, and are not normally required to serve in Africa.

Organisation

Metropolitan Spain is divided into nine Military Regions, each under a General Officer who holds the *ex officio* appointment of Captain-General and who also commands the military formations stationed there. These Military Regions are located as follows:

No. I	Military Region, Headquarters at	Madrid
No. II	"	Seville
No. III	"	Valencia
No. IV	"	Barcelona
No. V	"	Zaragoza
No. VI	"	Burgos
No. VII	"	Valladolid
No. VIII	"	Corunna
No. IX	"	Granada

Military Regions Nos. I to VIII are the equivalent of Corps-Districts, while No. IX Military Region corresponds to a Divisional District. The troops stationed in Military Regions Nos. IV, V, and VI are known as the Pyrenean Army, which includes specialised Mountain Divisions. In addition to the foregoing, there is a Military Zone known as the *Campo de Gibraltar* with its headquarters at Algeciras: this zone is under a Military Governor, who is responsible for all matters of both civil and military

administration. The three naval bases at Cadiz, Ferrol, and Cartagena are also commanded by Military Governors.

Outside Metropolitan Spain there are the *Comandancias Generales* in the Balearic Islands and the Canary Islands, each commanded by a Captain-General with headquarters at Palma and Santa Cruz respectively. In Morocco the Military Forces, which here include the Navy and the Air Force as well as Colonial and Native Troops, form a separate command under a "*General Jefe del Ejercito de Marruecos*" who is also the High Commissioner. In Morocco are two Corps-Districts, at Ceuta and Melilla.

Besides the formations allocated to the various Military Regions there is one armoured division and one independent cavalry division attached to No. 1 Military Region; and in Morocco there is one armoured brigade and one independent cavalry brigade.

Promotion of Officers and N.C.Os.

Young officers have to undergo five years' special training before they are posted to their units; this period is spent partly at the Military Academy at Zaragoza and partly at the school of the arm of the Service in which they are going to serve. Educational standards are high and competition is very keen. It is all the more unfortunate that officers' pay is extremely low—the basic rate for a second lieutenant being £7 a month and for a major only £12 a month. The result is—as Lieutenant-General Sir Brian Horrocks pointed out in *Picture Post* published on May 12, 1951—that many officers are often forced to undertake some form of civilian occupation in addition to their military duties in order to make both ends meet; and as the number of their children increases and the cost of living rises, they are apt to devote less and less time to the army.

The senior Spanish officers have all been on active service in Morocco and in Spain itself during the Civil War. Some served with the Blue Division in Russia; but apart from these few, there are none who have had experience of modern warfare. An interesting means of cutting out the dead wood from the senior ranks of the Army was promulgated in a decree published in July, 1949, which lays down that colonels and above who are passed over for promotion by 10 per cent. of the establishment of officers in their rank will be relegated to the Reserve.

Soldiers who display the necessary aptitude, and who attain the required educational standards, are eligible for promotion to N.C.Os. Seniority is taken into consideration when filling vacancies. Both serjeants and serjeant-majors rank as warrant officers and can be granted the equivalent of quartermasters' commissions.

Training and Equipment

Spain is not a highly industrialised country, and is therefore limited in its capacity to produce and maintain the technical equipment without which an army cannot play an effective part in modern warfare. The heavy equipment is therefore of foreign origin—for example, German *Pz KPFW IV* tanks and 88-mm. anti-aircraft and anti-tank guns. Some small arms and motor vehicles are manufactured in Spain itself.

These limitations in equipment inevitably produce corresponding limitations in training. No large-scale manoeuvres have been carried out

in Spain since the Civil War: as a result, the Army has had no practical experience of the latest battle techniques—such as co-operation between ground troops and aircraft, or between infantry and armoured units—although these operations are the subject of theoretical study by staff officers. Cavalry training, on the other hand, is good. A Spaniard needs little encouragement to adopt the role of a *Gay Caballero*, and the Spanish Military Jumping Team has recently gained some notable successes at international horse shows.

Value in War and Peace

In the event of war the Spanish Army would undoubtedly concentrate its main effort on the static defence of the Pyrenees, the brunt of which would be borne by the Mountain Divisions specially trained at the School of Mountain Warfare. Unfortunately, this great natural barrier can be outflanked from the sea and surmounted by airborne operations; so the success of the defence is bound to depend directly upon Allied assistance at sea and in the air, and upon the provision of the equipment necessary to create a powerful mobile reserve in rear of the mountains.

By and large, the Spanish troops are tough, wiry men of peasant stock. Their morale and discipline is generally good; and they are potentially first-class infantry soldiers, accustomed to extremes of climate and inured to privations and fatigue. The defeat of their armies in no way discourages individual Spaniards from continuing the fight in defence of their country—as Napoleon found to his cost; and indeed it is from the *guerrilla* (little war), originally carried on against the French invaders of Spain, that is derived the name now given to irregular fighters the whole world over.

In peace the power of the Army in domestic affairs appears, in the light of Western democracy, to be excessive. Nevertheless, many will concede that the outlook of the Spanish Army as a whole is to-day conservative rather than reactionary, and that the existence of the Army helps to stabilise law and order in a country where these elements might otherwise turn out to be unduly ephemeral. Whatever may be Spain's future developments in her external relations or her internal administration, it is to be expected that the Army will continue to exercise considerable influence for many years to come.

PART III

THE ARMY OF SWITZERLAND

Historical Background

The Swiss were the first people in Europe to adopt national service; and, as early as the late fourteenth century the eight cantons then comprising the Confederation could put into the field a total of more than 80,000 men. In order to facilitate mobilisation, each citizen-soldier was authorised to keep his personal arms and equipment in his own home. This system, with only slight modifications, has continued in force ever since. As a result of their military training, the Swiss were much sought after as mercenaries, and between 1350 and 1859 no less than two million of them undertook military service abroad. Of these 700 became general

officers, including the famous military historian and commentator, General Jomini, who fought for both the Emperor Napoleon and the Tsar Alexander I. It is also of interest to recall that certain English regiments—for example the 60th Rifles—were originally Swiss mercenary units.

In 1859 a law was passed which forbade Swiss citizens to accept military service outside the Confederation, except in the Papal Guard; but, regardless of this law, it is a well-known fact that the Swiss have fought in both the 1939–45 war and the 1914–18 war, in which 7,000 of them fell in the French Army alone. Thus, though the Swiss Army as a whole has not fought any major war since 1513, the Swiss nation has a long and honourable military tradition.

Military Service

The Swiss have no regular standing Army as such. There is, however, an Instructor Corps which consists of some 500 officers and N.C.Os. who serve full-time, as do also the senior officers equivalent to major-generals and lieutenant-generals. Instructor officers are selected from suitably qualified militia officers of the various arms who are prepared to volunteer for this duty.

The basic law governing military service is the Federal Law of April 12, 1907, whereby all male Swiss citizens, whether living in Switzerland or abroad, are liable to military service from the year in which they attain their 20th birthday until they reach the age of 60. Persons under the age of 20 may volunteer for service before they are due to be called up; but if they are accepted they will still be required to undergo their normal period of national service later.

Certain persons are *ex officio* exempt from military service—such as members of the Federal Council, warders of prisons, and Frontier Guards—but these all have to pay a military tax assessed at six francs per head, plus taxes on property, income, and capital up to a maximum figure of Frs. 6,000. The full tax is paid up to the age of 32, half tax up to the age of 40, and thereafter it is not normally demanded.

Every man while actually serving is entitled to pay, rations, lodging, and travelling allowances. Moreover, the State insures all serving men against accident and illness, and undertakes to maintain their dependents who cannot support themselves.

In addition to the foregoing duties, Swiss corporate authorities and individual citizens have further obligations to the armed forces, such as the provision of accommodation, food, animals, vehicles, recruiting centres, hospitals, and rifle-ranges if called upon to do so.

Training

Recruits are normally called up in February and June of each year. They then undergo a recruits course, which usually lasts for 118 days; and it is at this stage that potential officers and N.C.Os. are selected for further instruction. Thereafter service is generally carried out in the two echelons of the Mobile Field Army—the *Elite*, up to the age of 36, and the *Landwehr*, between the ages of 37 and 48—and afterwards in the static units of the *Landsturm* up to the age of 60. In addition there are the auxiliary services composed of men classed as unfit for general service, together with volunteers and those who have finished their service with the *Elite*,

Landwehr, and *Landsturm*. There is no conscription for women, but individuals may volunteer to join the auxiliary services; in the case of married women the approval of their husbands is necessary.

After joining these units all personnel have to carry out a certain number of refresher courses, which normally last for three weeks. In the years in which militiamen do not attend these courses they undergo a one-day inspection of the arms and equipment which they are authorised to retain in their personal possession. A further, and important, obligation of service for all subalterns, warrant officers, N.C.O.s., and other ranks serving in units equipped with rifles is to take part in the annual musketry courses organised by State-subsidised rifle clubs. In addition, special training courses for different arms and formations of the Swiss Army may be ordered by Federal decree.

The High Command

Control of the Army is exercised by the Federal Council through its own Military Department, which functions as the Ministry of Defence, and through the Military Departments of the Cantons which are responsible for recruiting and the formation of units in their respective areas. The Federal Councillor in charge of Military affairs is Doctor Karl Kobelt: he is not only head of the Military Department of the Federal Council but also presides over the National Defence Committee, which is roughly equivalent to the British Army Council. When war appears imminent the military functions of the Federal Councillor are vested in a general who is then appointed Commander-in-Chief with many additional powers and who becomes virtually the dictator of the country.

Organisation of the Army

Federal law expressly forbids the maintenance of a standing army in time of peace. However, military personnel in fact undergo their annual period of training with the units which they will form on mobilisation. In the meantime the role of the full-time element in the Swiss Army is to train recruits for the different arms of the Service and to organise and conduct refresher courses for them. The mobilised Swiss Army will consist of four Corps Districts, to which will be allocated in varying strengths a total of nine divisions, three Mountain Brigades, and certain other specialised formations such as Frontier Brigades, Light Brigades, and Redoubt Brigades. The mobilisation potential of the country amounts in theory to a quarter of the total population of 4½ million; but in practice it would seem most improbable that economic and industrial manpower requirements would permit numbers in excess of about 800,000 men to be called up for more than a few weeks at a time.

The General Staff consists of officers who successfully complete General Staff courses. To qualify for selection to attend these courses, each candidate must be of the rank of captain and must have successfully commanded a unit for at least two refresher courses. The Chief of the General Staff, Lieutenant-General Louis de Montmollin, is a member of the National Defence Committee, as are also the Director of Military Training, Lieutenant-General Hans Frick, and the Commanders of the four Corps Districts. The following table gives the military ranks of the Swiss Army, with their English equivalents.

<i>Swiss Titles</i>		<i>English Equivalents</i>
<i>German</i>	<i>French</i>	
General *	General *	General *
Oberstkorps-Kommandant	Colonel Commandant de Corps	Lieutenant-General
Oberstdivisionar	Colonel Divisionnaire	Major-General
Oberstbrigadier	Colonel Brigadier	Brigadier
Oberst	Colonel	Colonel
Oberst-Lieutenant	Lieutenant-Colonel	Lieutenant-Colonel
Major	Major	Major
Hauptmann	Capitaine	Captain
Oberleutnant	Premier-Lieutenant	Lieutenant
Leutnant	Lieutenant	2nd Lieutenant
Adjutant-Unteroffizier	Adjutant Sous-Officier	W.O. Class I
Feldwebel	Sergeant-Major	W.O. Class II
Fourier	Fourrier	C.Q.M.S.
Wachmuster	Sergeant	Sergeant
Kaporal	Caporal	Corporal
Gefreiter	Appointe	Lance-Corporal
Soldat	Soldat	Private

* Appointed only in national emergency.

Equipment

The war in Korea has been followed with close attention in Switzerland. It has emphasised the need, strategically, to be prepared for defence against sudden aggression launched with little or no warning; and it has also demonstrated the value of well-armed and mobile troops in holding up opponents numerically stronger both in men and equipment. The Swiss authorities seem to have realised that they cannot hope to equip their armed forces *after* hostilities have begun: so, because they are also fully aware that their neutrality will be respected in direct proportion to their preparedness to defend it, they have wisely begun an extensive programme for reorganising and rearming their forces.

In October, 1950, a Federal Council "message" gave a realistic appreciation of the present situation: "The problem of equipment is of decisive importance. . . . As long as we do not provide our Army with new and high-grade equipment, we will not have achieved the urgently necessary increase in our military preparedness—and this in spite of any reorganisation that may be effected."* Accordingly the following new weapons are being introduced: a new quick-firing machine-gun, a rocket tube anti-tank weapon to supplement the infantry's existing short-range armour-piercing rifle grenades, and three-tube anti-aircraft guns for the infantry. In addition, armoured units are to be strengthened; the field artillery is to be completely mechanised; and heavy anti-aircraft units, previously manned largely by the auxiliary services, are now being modernised with all the latest aids and given full military training.

Hitherto Switzerland's own flourishing and efficient armaments industry has sufficed to produce the greater part of the equipment required for her armed forces. Now, in order to obtain the new equipment as soon as possible, many items have been ordered abroad. Most foreign factories are, however, fully occupied in supplying the armed forces of their own

* Quoted from article in *Allgemeine Schweizerische Militärzeitschrift* of December, 1950, pp. 837 *et seq.*

countries, so it seems probable that much of the equipment needed will have to be manufactured under licence by Switzerland's own industry.

Swiss Strategy in the Event of War

The strategy of the Swiss Army is affected by two main factors: first, the Swiss are not prepared to wage war beyond their own frontiers; and, secondly, Switzerland is unlikely to have to fight a long war single-handed, for should one belligerent violate Swiss neutrality, help would presumably be forthcoming from the other side. Swiss strategy is therefore based entirely on a defensive concept. Trading space for time, the Army, if and when compelled to withdraw before superior invading forces, aims to conduct a fighting retreat through defences in depth until reaching the Alpine citadel known as the National Redoubt based on the natural fortresses of Sargans, Saint-Gotthard, and Saint Maurice. This is an elaborate system built to a great extent underground, with storehouses, living accommodation, repair shops, hospitals, and even power stations hewn out of the living rock. Extremely difficult to attack by direct assault, the Redoubt is expected to be held until food, medical supplies, and ammunition stocks are eventually exhausted.

Value for War

Every Swiss citizen cheerfully accepts his national service as an obligation to the State; and there is no doubt that the militia system, in conjunction with efficient plans for rapid general mobilisation in time of crisis, will produce an effective nation-in-arms. The main weakness of this system is the comparatively short time available for initial training and for refresher courses in the latest techniques and equipment. As aptly stated in *The Times* of November 18, 1950, "Modern weapons and equipment are complicated and need a high degree of technical training, which cannot be simplified beyond a certain point, and a great deal of instruction will in future have to be compressed into a short period."

The High Command and Staff comprise methodical and conscientious officers with a good theoretical knowledge of the art of modern war. The regimental officers, warrant officers, and N.C.O.s. have all the characteristics required for resolute and determined leadership. Morale is excellent, and political subversion is most unlikely to make any headway. Fighting on ground which they know, the armed forces have the indomitable will to resist aggression and the undoubted capacity to fight a defensive war from static positions.

"ROGER EASY"

CHAPTER XXI

ARMY ADMINISTRATION IN WAR

SOME IDEAS ON THE PROBLEM UNDER MODERN CONDITIONS

I. DEFINITIONS

ADMINISTRATION has recently been officially defined as follows: "Administration is the organisation, discipline, and well-being of men, and the movement and maintenance of men and materials; but the extent to which organisation is a part of administration varies in the three Services."

At the same time the following definition was given to the word "logistics." "Logistics is the science of planning, and carrying out, the movement and maintenance of forces."

Although, in view of the international character of most present-day military undertakings, it is desirable that we should know the meaning of terms commonly used by our greatest ally, there appears to be no reason to discard our own word "administration" in favour of the American one. It seems that "administration" covers "logistics," and if anything the former is the more comprehensive word.

II. THE SOLDIER'S REQUIREMENTS

In the past, when armies were small and their equipment simple, administration was an easy matter. The troops lived on the country for food and clothing and to a very great extent made and replaced their own rudimentary weapons, equipment, transport vehicles, and animals from local resources.

When Napoleon introduced the system of large conscript armies it became impossible for the troops to live on the country, and consequently it was necessary to make special provision for supplies by bringing them up from the rear in cumbersome horse-drawn supply columns. Since then the administration of any army in the field has become vastly more complex. Whereas 200 years ago administration had to fall into step with strategic, or tactical, requirements, it is now often the major factor in deciding the pattern of a campaign or battle—what is or what is not possible. The reasons for this are not far to seek. Armies are now of vast size, sometimes running into millions in a single theatre of operations. Modern weapons and equipments are very complicated, and even a moderate-sized army requires tens of thousands of wheeled and tracked vehicles, hundreds of thousands of gallons of petrol per day, and a continuous stream of rations, ammunition of varying kinds, and spare parts for guns, vehicles, wireless sets, etc., on a vast scale.

This is not the whole administrative problem, however. The old-time professional soldier was a hardy customer. Unless a man was prepared to endure privations either he did not join the Army or else did his best to avoid service. Moreover, his cause was not sponsored by public opinion. If he died, was maimed, or neglected nobody cared very much. Although campaigns were often of long duration, battles were short and infrequent, and there was little fighting between battles. Consequently it is doubtful if the soldiers of former times suffered the terrible hardships we are apt to

imagine. Much of their time was spent in comfortable billets and men of good character were given much more freedom than is usually supposed.*

In twentieth-century war soldiers are drawn from every class. In addition, mankind has advanced so rapidly in the past fifty years—although we may not always think so—that what were once regarded as luxuries have become necessities. If the morale of an army is to be maintained plentiful supplies of cigarettes, fresh meat, letters from home, clean under-clothing and socks, razor blades, etc.—coupled with frequent leave, concert parties, hot baths, canteens, and wireless sets are now considered to be essential. Woe betide the army staff which omits to supply even one of these comparatively modern innovations. They will soon be the victims of Press headlines and questions in Parliament. A recent example of this is the alleged shortage of winter clothing for British troops in Korea, which was the subject of much comment in Parliament and in the Press last January.

It must not, however, be thought that these luxuries-turned-necessities are required entirely because of the modern soldiers' lack of hardihood when compared with his predecessor's. It is in some measure due to the greater strain imposed by modern conditions—periods of long, close contact with the enemy, and the violence and shattering effect of modern weapons. Whatever the cause may be, it has been proved to the hilt in two world wars that unless the soldier has confidence in the administrative arrangements for his welfare, and considers that he is being "done" as well as is humanly possible, he will not fight properly.

III. HOW THE SOLDIERS' REQUIREMENTS ARE MET

The soldiers' requirements may be divided into two main categories :

(a) *Those common to all human beings.*

Bread, underclothing, cigarettes, water, concert parties, petrol, etc.

(b) *Specialist requirements.*

Tanks and military wheeled vehicles, guns, machine guns, ammunition of all kinds, military bridging equipment, military wireless sets, etc.

Practically all these requirements have to be grown and processed, mined, or manufactured—or purchased and imported from overseas. A very small proportion may be obtained in the theatres of operations. In the case of those articles common to all human beings there will be no very great increase in total requirements, as a soldier demands very little more food, non-specialised clothing, etc., than a civilian. The specialised articles will, however, be required in vastly increased quantities, and it is these that make war, and the present peacetime rearment programme, such a costly and ruinous business. With Continental countries, fighting on or near their own frontiers, the *production* charges for war materials are the major portion of the total cost. In our own case, however, and also in the case of the U.S.A., the strain on *transport* is much greater. Our campaigns are invariably overseas, involving the transportation of

* See the recently published book "The Letters of Private Wheeler 1809-1928," edited by B. H. Liddell-Hart (Michael Joseph Ltd.).

huge quantities of men and materials by sea, rail, road, inland waterways, and air.

Under the British system the production and supply of war materials to the Armed Forces is the responsibility, in most cases, of the Ministry of Supply—although with technical equipment the War Office, and other Service Ministries, have a hand in design. Apart from this latter, however, the Army's responsibility commences when the supplies, or finished products, are delivered to Army personnel in an Army establishment.

The process of transporting Army personnel and material from the Home Base (in our case the United Kingdom) to the theatre of operations is carried out by the Army in conjunction with the Ministry of Transport and the Royal Navy—the latter being responsible for the safety of the ships while at sea, assisted on occasions by the R.A.F.

Once the personnel and material arrive in the theatre of operations sole responsibility for administration falls on the Army authorities.

IV. ADMINISTRATION IN A THEATRE OF OPERATIONS.

It has been explained that up to the stage when personnel and material enter a theatre of operations the Army shares responsibility for supply and administration with other Government departments—the Ministry of Supply, the Ministry of Transport, and the Royal Navy. Once in the theatre of operations the Army (i.e. Land Force Commander-in-Chief) assumes sole responsibility.

It is clear that every able-bodied man employed in an administrative capacity reduces the number of men available to fight, and as the object of war is to fight with maximum efficiency, and at maximum combat strength, it is obvious that strict economy in administrative personnel is an important factor. Similarly, all unnecessary administrative material—vehicles, machinery, etc.—adds to the Commander-in-Chief's difficulties, by causing dock and road congestion, demands for excessive depot facilities, and additional men to operate in an administrative capacity. It also reduces his powers of manœuvre, or in other words makes his force a cumbersome machine to handle.

It is, therefore, one of the Army's main war problems to reduce the size of the "administrative tail" (as it is called) without impairing the fighting efficiency of the force. The rest of this chapter is devoted mainly to discussing this problem.

For efficient administration the following conditions are necessary :

- (a) The scale of food, clothing, equipment, transport, entertainment, medical and spiritual welfare, etc., must be sufficient to maintain the fighting units in good health and morale and in a battleworthy condition—but no more.
- (b) As far as possible equipment must be of the simplest kind and standardised. Multiplicity of types—in such items as ammunition, spare parts for lorries, etc.—leads to endless difficulties and complications.
- (c) Transport vehicles must be maintained in a highly serviceable condition and used economically.
- (d) The "permanent way" for road, rail, and inland water communications must be maintained at a high standard in order to ensure a quick turn round of M.T. vehicles, railway trucks, and craft.

- (e) Economy in administrative manpower. Every officer and man must be fully trained to his task, be located in the right place, and perform a full day's work.
- (f) Friction among administrative staffs, and between administrative Staffs and Fighting personnel, must be avoided. Every department and individual must co-operate to the full with its neighbours.
- (g) The army in general, and the force in particular, must be organised in such a manner as to facilitate easy administration.

This is the ideal state of affairs. Unfortunately, it is never realised; but the army which approaches this standard will have an immeasurable advantage over opponents whose administration is at "sixes and sevens."

As a generalisation it may be said that the British Army in the early months of a national war falls far short of administrative perfection, due to the facts that our commitments almost invariably exceed our means and that the necessity for rapid and large-scale expansion throws the administrative machine temporarily out of gear. In the final campaigns British Army administration usually reaches a very high standard. Examples to support this are not difficult to find. The troops sent to Norway in 1940 were considerably handicapped through lack of proper clothing and equipment. In the early weeks of the war against Japan in Burma and Malaya, British and Indian troops suffered from a very cumbersome administrative set up, especially as regards transport, which put them at a very real disadvantage against the highly mobile Japanese troops. In the latter stages of the war in Italy, Burma, and North-West Europe the British Army's standard of administration was exceedingly high, especially during the early phases of the Normandy campaign in 1944.

To show the magnitude of the problem it will be as well to quote a few figures :

- (a) During the campaign in North-West Europe in 1944-45 it was calculated that an army Division (Infantry or Armoured) required from 600 to 700 tons of supplies per day. With thirty-six Divisions in action, which was the number of Allied Divisions after the build-up on the beach-head had been completed, a daily delivery of some 20,000 tons was necessary.
- (b) By July 2, 1944 (four weeks after the landings), the number of vehicles in Normandy was 171,532.
- (c) During the first four weeks of the Normandy campaign of 1944, 51,796 Allied wounded had to be cared for and evacuated.
- (d) During the advance through France of General Patton's 3rd U.S.A. Army in August, 1944, the daily requirements in petrol for that army was approximately 400,000 gallons.

Although these figures give some idea of the problem as far as major items are concerned they are only a part of the total administration problems which arise in an army of millions of men. Comparatively small problems, but nevertheless vital if fighting efficiency is to be maintained, absorb a much greater comparative effort—delivery, collection, and censoring of mail; pay; provision of clean clothing; hot baths; repair of

boots; spiritual welfare; facilities for sport and recreation, leave—these are only some of the matters which are necessary if morale is to be maintained.

V. THE ADMINISTRATIVE MACHINE

From the huge problems involved it will be clear that their solution depends on a sound organisation and a competent trained staff, and other personnel, to run it. It would be quite beyond the scope of this article to give a comprehensive survey of the organisation of Army administrative staffs and services; but it is possible to give a summary, in broad outline, which will be sufficient to show the principles on which the problem is tackled.

The Army consists of three categories of personnel:

- (a) Fighting troops.
- (b) Staff.
- (c) Services.

Of these (a) are the personnel who perform the task for which the Army exists—fighting; (b) and (c) exist for the purpose of directing the fighting troops and providing them with their requirements. In other words, the staff and services are the administrators—although in addition a number of administrative personnel form part of every combatant unit.

The Staff is divided into three main branches:

(a) *General Staff Branch*

Concerned mainly with operations, and to a less degree with administration.

(b) *Adjutant-General's Branch*

Responsible for discipline, recreation, spiritual and medical welfare, etc.

(c) *Quartermaster-General's Branch*

Responsible for quartering, supplies of all kinds, and transportation and movement.

It may be said that while the General Staff exercise general control over administration the Adjutant-General's and Quartermaster-General's Branches issue the executive orders for, and directly control, administration.

Each branch of the Staff has representatives among the Staff officers at every Headquarters. In the case of a lower formation, such as a Brigade Headquarters, there may be only one for each branch. In a large Headquarters, such as an Army or Army Group, each branch is divided into many sub-branches and the total number of Staff officers may run into hundreds.

The services exist for the purpose of carrying into effect the administrative orders issued by the Staff. They consist of a variety of corps and departments—Royal Army Medical Corps, Royal Army Service Corps, Corps of Royal Electrical and Mechanical Engineers, Royal Army Pay Corps, Royal Army Dental Corps, and many others. These services absorb an immense number of men and great quantities of material. In some campaigns the proportion of administrative personnel to fighting men is as much as four to one, or even more.

In general terms the process by which an army is administered is as follows :

- (a) The number of administrative personnel and units allotted is in proportion to the number of fighting troops, taking into consideration local conditions in the theatre of operations—road and rail facilities, length of the lines of communication, local resources, climate, etc.
- (b) The Commander-in-Chief, assisted by his General Staff, draws up the plan of campaign, or the plan for a particular operation, having consulted his Administrative Staff as to its practicability. In practice consultation begins on the inception of the plan, and as a result of administrative difficulties most projects have to be modified many times in course of preparation.
- (c) Having settled the outline plan of campaign, it then falls to the Administrative Staff to arrange for the day-to-day administration of the force and for any special administration necessary for particular projects. This they do by means of administrative instructions and orders issued to the various administrative services and departments. The channel of communication is through the Staff and Heads of Services and Departments at each formation headquarters—Army Group to Armies and Headquarters Lines of Communication ; Army to Corps ; Corp to Divisions ; Division to Brigades ; Brigade to Units.

This, in its simplest form, is the manner in which an army in the field is administered.

VI. ADMINISTRATIVE BALANCE

It has been mentioned earlier, and indeed it is apparent to any individual with only a cursory knowledge of military affairs, that an important factor in success is to strike a correct balance between administrative personnel and equipment and fighting troops and their equipment. If an army is too lavishly provided administratively it will become cumbersome and immobile, and operational efficiency will suffer. If it is under-administered the troops will suffer hardships and their morale will deteriorate, maintenance and replacement of vehicles and other equipment will fall into arrears, operations will suffer through shortages of shells, petrol, and other essentials, and again the fighting troops will lose efficiency.

As with all problems, it is an easy matter to point to difficulties which may arise. It is not so easy to provide the ideal or even a good solution.

Experience in many campaigns has shown that unless very carefully watched, and unless energetic corrective measures are taken from time to time, an army tends to be over-administered and to accumulate administrative personnel and equipment beyond its reasonable needs. It is recorded that in the First Afghan War of 1838-42 one officer had eleven camels (each carrying a load of about 600 lb.) for his personal belongings. In the same campaign a certain regiment carried its peacetime officers' mess table about with it. It is on record that at one stage in the Mesopotamia campaign in World War I, when the troops were on half rations

owing to shortages of mechanical transport, 180 cases of beer were sent forward in Ford vans as a result of a priority signal message. In their earlier campaigns in World War II it is not untrue to say that some American formations maintained a wholly unreasonable administrative standard. Luxuries of all kinds were sent forward when transport was none too plentiful and roads were congested. Needless to say, this was quickly remedied.

There are two methods of ensuring correct administrative balance:

- (a) By calculating the essential requirements, providing them (and no more), and seeing that the scale laid down is not exceeded.
- (b) By making arbitrary cuts.

Theoretically (a)—matching reasonable needs to operational efficiency—is the best method and is, of course, the one on which most campaign planning is based, although availability often limits provision below what is considered necessary. Such calculations have the disadvantage, however, that they are often based on data provided by the users. Human nature, being what it is, often exaggerates requirements, and unless the staff responsible are very experienced—and it is difficult for them to be so in every detail—they are apt to accept demands which they consider reasonable, but which are, in fact, considerably in excess of requirements. This is almost invariably the origin of the over-long “administrative tail” from which field armies so frequently suffer.

The other method—that of arbitrary, and often drastic, cuts—although illogical, has often proved very effective. The individual making the decision must, however, be possessed of considerable experience and shrewd judgment or he may overstep the mark, in which case fighting efficiency will be seriously reduced. This method has often been employed with success for a particular operation when time did not permit of detailed calculations.

Many examples could be quoted of arbitrary administrative decisions which, although viewed with dismay at first, proved successful:

- (a) When in 1918 the late Field-Marshal Lord Allenby was planning the final battle of the Palestine campaign he is reputed to have been informed by his staff that the huge mass of horsed cavalry at his disposal could not be fed or watered in the event of the deep penetration into the enemy lines which he contemplated. After a few minutes' thought he is reported to have said, “I see, but they will go just the same, and I expect them to be watered and fed.” They went, the campaign was a great success, and it resulted in the surrender of Turkey. Casualties in the Cavalry were not very heavy.
- (b) In 1944 some units of Field-Marshal Lord Montgomery's 21st Army Group embarked for the campaign in North-West Europe on a very reduced scale of transport, which all declared to be quite inadequate except as a temporary expedient. Actually the units found the reduced scale so satisfactory that, although given the opportunity, they never reverted to normal scale and continued the campaign for some months with their original number and type of vehicles.

On the other hand where judgment is faulty much inefficiency can result from arbitrary cuts :

- (a) In Great Britain at one period during the late war one "carless day" per week was instituted in the Army. No vehicle was permitted on the roads on these days except with a certificate signed by an officer not below the rank of Lieutenant-Colonel. Great inconvenience was caused—leave parties were held up; fine days were missed for training and demonstrations, which were carried out later in bad weather; important mail was delayed, etc. The idea was to save petrol and wear and tear of vehicles. It was not successful: if the "carless day" was on Tuesday it merely meant that the unit vehicles did twice as much running on Wednesday.
- (b) Many attempts were made during the war to deprive officers of fighting units of their batmen on the grounds that a personal servant was undemocratic, was not the vogue in the American Army, pampered young officers unduly, and reduced fighting strengths. This was a very questionable move. Junior Army officers worked at high pressure during the war, and to insist on them cleaning their own boots, washing their own clothes, and performing other jobs unconnected with their military duties, would have lowered their efficiency considerably. Moreover, there would have been only a negligible saving in fighting manpower, as in a good fighting unit batmen acted as orderlies, the officer's personal escort, and also assumed a fighting role in battle.

The problem of reducing to the minimum the "administrative tail" is not an easy one. It is not only a question of laying down scales and rules: it is also one of inspection to see that orders are observed, of frequent alterations to meet ever-changing conditions, and of devising a system which is sufficiently elastic to make possible changes at short notice to meet particular circumstances.

VII. A FEW SUGGESTIONS

Army administration being essentially a matter of detail and involving problems which differ in varying types of units, it is not easy to make recommendations for improvement in an article of a few thousand words. Any suggestions must be, therefore, on general rather than particular lines.

The problem is best explored by division into two headings :

- (1) Fundamental problems of organisation.
- (2) Detailed problems of administration.

We will take each separately.

(1) *Fundamental Problems.*

(a) *The Elimination of Over-insurance.*

In the days of horse-drawn transport, moving at three miles per hour, it was difficult to correct a mistake or an underestimate of requirements. In these days, with mechanical transport moving at thirty miles per hour, and the air as an alternative means of supply, this is no longer so. Deficiencies are more easily and more quickly made good. In view of

this commanders and staffs should be trained, and encouraged, to take calculated administrative risks.

(b) Increased Use of Air Transport.

One of the chief administrative problems is traffic congestion on roads, particularly in the forward areas during battle. The airplane as a vehicle of supply is only a partial answer, as it depends on elaborately constructed airfields which may be far removed from supply depots and is not a satisfactory means of delivering personnel or material in areas without landing facilities.

On the other hand, the large-scale helicopter—capable of conveying twenty to thirty people, some thousands of pounds of material, small road vehicles, and weapons such as field artillery pieces—offers great possibilities. It can land almost anywhere and is, therefore, capable of picking up its load from supply depots direct, or any other location, and delivering to almost any place in the forward area not under small arms fire. It could often return fully or partly loaded with wounded, important prisoners, leave personnel, outgoing mail, etc.

An army with a well-organised fleet of large helicopters would have solved many of its supply problems.

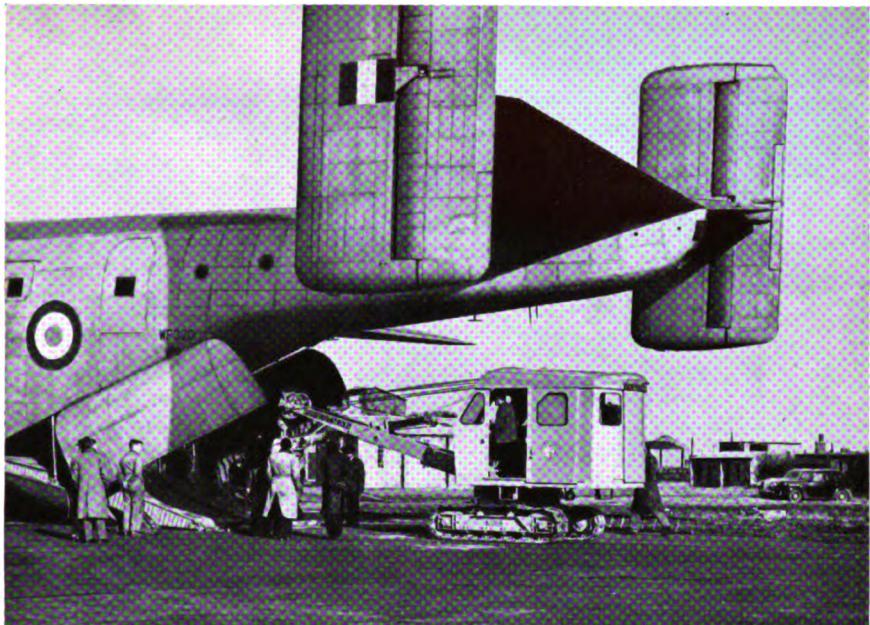
(c) Reorganisation.

It seems that the days of huge manpower armies, with millions of men facing each other on rigid battle-fronts extending for hundreds of miles, are over. It is likely that war of the future will be conducted by fast-moving, comparatively small, but very powerful armoured formations, supported on the ground by lorried infantry and in the air by numerous aircraft specially designed for the purpose. The manpower armies may follow later to consolidate the ground gained.

In an American-type Division as at present organised only about 1,160 (or 6 per cent.) of the total 18,700 men are fighting infantrymen. If to these are added the Artillery, tanks, etc., which support them we get a figure of, at the most, 15 per cent. fighting men. The remaining 85 per cent. are administrative personnel and technicians not actually involved in fighting.* Obviously in the smaller armies envisaged this proportion of overhead charges to fighting men *must* be reduced, and drastically reduced. The present high proportion of administrators not only involves feeding (and otherwise providing for) an immense number of unnecessary mouths, but also makes columns very cumbersome and restricts the speed and daily distance of movement.

It would appear that the present Divisional organisation—which in the past forty years has increased in size but decreased in fighting effectives—is now outmoded and requires to be completely overhauled and superseded by a more modern organisation in which fighting men predominate over administrators and technicians. How this is to be brought about can be solved only by deep study. It will be sufficient to indicate the possibilities of a more centralised organisation for non-fighting personnel. At present most major units have their own fitters, electricians, medical

* For these figures and further details of this theme, see "The Structure of a Modern Army," compiled by a group of determined French officers, published in the *Army Quarterly*, July, 1952, and translated under the direction of Captain B. L. Liddell-Hart.



Blackburn " Universal " Freighter



Douglas C.124 Globemaster

personnel, pioneers, etc., most of whom are only engaged spasmodically—often for not more than a few hours per month—on their specialised duties. A system under which a smaller total number of such specialists were “pooled,” at Divisional, or Corps Headquarters, for allotment to units when required has obvious possibilities. In other words, fighting formations and units should consist of fighting men plus only the absolutely essential non-fighters. The administrators and technicians—more especially those whose duties are spasmodic—should be kept in rear under centralised control and sent forward when and where required. This conception is the germ on which any re-organisation should be based.

2. *Detailed Problems of Administration*

It can be assumed that any major war will extend the nation to the full, in both manpower and industrial output. Economy in men and material will be vital. Every luxury which does not contribute to efficiency will have to be cut out, and we may have to do without many things which we have come to regard as necessities.

The first essential is a good organisation and the best and most economical equipment available—as outlined earlier. Given these the task of economising in detail can be tackled with confidence. The following are the lines on which detailed economies might be affected :

(a) *Headquarters Staffs*

In the closing stages of the campaign in South-East Asia the overall command was vested in Lord Louis Mountbatten, whose Headquarters was known as S.E.A.C. (South East Asia Command). The Land Forces were controlled by Headquarters, A.L.F.S.E.A. (Allied Land Forces, South East Asia) Both these Headquarters were on a fantastic scale. In appearance they resembled medium-sized townships; they absorbed thousands of officers and tens of thousands of men, and for all practical purposes they did no more than control the 14th Army in Burma, which itself had a very large Headquarters. Can we in future afford these vast organisations and are they really necessary?

Do we have too many Field Formation Headquarters? In the Russian Army Corps Headquarters is cut out, Divisions being directly under Army Headquarters. In any case it would seem that our field Headquarters are often on too lavish a scale. In North-West Europe in 1944-45 the British Liberating Armies required one Army Group Headquarters, two Army Headquarters, and six Corps Headquarters—to control a force of approximately seventeen Divisions.

Many attempts have been made in war and peace to reduce the sizes of swollen staffs. These attempts have rarely had more than a temporary success, mainly because they were never accompanied by a reorganisation of the system. A thorough reorganisation of our system of command, and our Staff system, might result in a very great reduction in the drain on skilled manpower and material involved in the present organisation.

(b) *Rearrangement of Administrative Duties*

In the days of sailing ships and horse transport, and before the introduction of aircraft, an overseas Army had to be practically self-contained. With rapid modern means of transport there appears to be no reason why

certain administrative duties carried out in the theatre of war could not be equally well carried out at the War Office or elsewhere at home. Such matters include pay, records and accounting, censorship of mail and Press reports, courts martial and other legal matters, etc.

Many establishments hitherto maintained in the theatre of war might be retained at home—base hospitals (patients being flown home), branches of the Intelligence Staff not concerned with urgent operational matters, schools of instruction, and many of a similar nature.

It may be that in view of the increased speed of transport it will not be necessary in future to maintain such large reserves of reinforcements, supplies, ammunition, vehicles, etc., in the theatre of war as was the case formerly. In this connection it is worth noting that in 1940 we paid a heavy price for the huge reserves of material built up in France which were lost as a result of the Dunkirk evacuation.

All these reductions in the theatre of war would reduce "overhead charges" and ease administrative congestion in the actual battle areas.

(c) Pruning the Administrative Staff

Apart from any reorganisation or major redistribution of administrative duties, it appears likely that a close examination of the whole fabric of Army establishments could result in the elimination of many redundant personnel without serious loss of efficiency. One can only touch on the fringe of a problem of this magnitude, but those who participated in the last war can usually recall many instances of non-fighting personnel whose services might well be dispensed with—the immense number of Press correspondents with their attendant conducting officers, clerks, etc.; large concert parties, many of which were good, but many of doubtful value. Within every type of fighting unit some reductions could be made in such appointments as clerical staff, medical orderlies, mechanical transport personnel (other than driver-mechanics), provost, etc. In non-fighting units the number of perhaps desirable, but by no means essential, personnel must be legion.

VIII. CONCLUSION

In this article an attempt has been made to cover the whole field of administration in a modern army in war—as it is likely to occur in the event of another major conflict. It will be apparent that the main theme is the reduction of the high proportion of administrators to fighting men, which from the point of view of battle efficiency not only results in excessive mouths to be fed, but makes the force unduly cumbersome and vulnerable. It is not untrue to say that its satisfactory solution is the Army's main problem to-day. Moreover, it is one affecting the other two Services and industry, in fact the whole structure of our potential war effort.

Summarised, it may be said :

- (a) That the problem can only be solved by a complete reorganisation of the Army, and in particular drastic modification of the existing Divisional system on which a field army is at present based.
- (b) That a thorough investigation should be made of the possibilities of the air (i.e. the helicopter) as a normal means of supplying land forces, with the object of reducing road congestion and the handling of equipment and stores.

- (c) That drastic pruning of all luxuries is essential. This must be done with understanding and common sense in order to avoid unnecessary hardships which will adversely affect morale.

Finally, all concerned with our Army must realise the simple, but often forgotten, truth that the sole purpose of an army is to fight the Queen's enemies, and the sole reason for the existence of non-fighting personnel is to assist and administer to the fighters and enable them to fight with maximum efficiency.

C. N. BARCLAY

CHAPTER XXII

ARMY TRAINING

The training of the British Army has often been decidedly patchy—rather like the little girl with the curl—"When it is good, it is very, very good, but when it is bad, it is horrid."

At the beginning of the Napoleonic wars training was execrable. It was not until Sir John Moore and after him the Duke of Wellington tackled the training problem that British troops really began to be effective in battle. The British Army which endured such privations in the Crimea 1854–56 was also deplorably trained. Kinglake in his "Invasion of the Crimea" remarks that in the preceding long period of peace "it became the duty of those who were employed in the military administration not to cause the country to practice itself heartily for the eventuality of another war, but simply to maintain as far as they could a monotonous peace in the Army."

The British Army which went to South Africa in 1899 was once more a badly trained one. Colonel F. R. Henderson, the author of "Stonewall Jackson," in a study of the training of the army before that war comments naïvely that "manœuvres are the best means of making certain that the senior officers of an army do not grow stupid." He then goes on to say that, in 1898, manœuvres in which two "Army Corps" took part were tried for the first time in twenty-six years! To the British government and the musty old War Office in Pall Mall, the Franco-German War, Moltke, and the German General Staff might never have been. The output of staff officers from Camberley in those days was thirty-two per annum. Consequently most of the staff officers in the South African War had to be regimental officers possessed of no staff training whatsoever. No wonder the term "regrettable incident" had to be invented to mask the colossal blunders which occurred.

Henderson, who was an eye-witness of some of the fighting in South Africa, declares, "The chief defect of the great mass of British soldiery was their unreadiness for war."

The failings of the Army of 1899–1903 in organisation and training at last attracted the serious attention of the British Government. Reforms recommended by the Esher Committee and carried out by Lord Haldane produced both the Territorial Force and the B.E.F. of 1914. The latter was probably the best trained expeditionary army ever to leave the shores of Great Britain at the start of a war. But even so the problem of expansion to the size required for the new policy of fighting on the Continent with the whole strength of the nation had to be solved after the outbreak of hostilities. Not unnaturally, as Sir James Edmunds, the official historian, has pointed out, the magnificent divisions which were so speedily raised never attained the same standard of training as the original B.E.F.

After World War I the British Government was again very slow "to practise the country heartily for the eventuality of another war." Even the stimulus of Hitler's seizure of supreme power in 1933 failed to move the

Government to tackle in good time the organisation and training of a large modern army. When the time came a B.E.F. comparable to that of 1914 did not exist.

When Mr. Hore-Belisha courageously grappled with the expansion problem it was already at least five years too late to organise a sizeable and well-trained army in time for the outbreak of hostilities. By concentrating all his resources, he might conceivably have put together a well equipped B.E.F. of six to seven divisions, of which two might have been armoured. A B.E.F. of this quality might have induced the French High Command to attack Germany on the Western Front in the autumn of 1939 during the Polish campaign instead of being content to do nothing. Such an attack resolutely carried out might have changed the whole course of the war in the West. As it was, the effort to form and train a large number of hastily created new divisions resulted in the removal from the already depleted regular formations of a large percentage of their best officers and N.C.Os. Their dilution with men "unready for war" was too great.

The B.E.F. of 1939, well led as it was by Lord Gort and other first-class Commanders, fought with characteristic staunchness but it was, for all that, insufficiently trained and badly equipped. The fault lay with the successive British Governments between the wars, not with the leaders of the Army.

World War I had provided the country with an admirable band of regular soldiers who had acquired most thorough experience of fighting in their youth and who had added to their military knowledge in peacetime. Many of them have risen to prominence not only in the Army but also in civil life. Such men well knew how to train and lead large formations, but in Great Britain the essential troops and modern equipment were never supplied. In India where the British-Indian units were kept up to strength, the general standard of training was probably better than in any other army in the world.

CONDITIONS TODAY

Having twice within thirty years narrowly escaped destruction the British people have learnt their lesson. To its immense credit the Labour Government of 1945 did not hesitate to decree that National Service was to continue even although the war was over. The British people nobly shouldered the burden. With the increasing intransigence of the U.S.S.R. the Government also stepped up the periods of National Service with the colours from twelve months to eighteen months and finally from eighteen months to two years. Moreover after his two years active service with the regular Army the National Serviceman must now do four years part-time service in the Territorial Army, which will shortly, for the first time in its history, be up to strength in peacetime with men "ready for war."

Nor is the gradual building up of a sound reserve Army the only military problem, which the advent of the two-year National Service soldier has made it possible to solve.

Enlistment in the Regular Army both before and after World War II has never been sufficiently large to keep the regular units up to strength. The requirements of the "cold war" in the Far East and the pressure of events in Persia and Egypt have compelled the military authorities to fill the gaps in regular drafts with N.S. men. As a temporary expedient it is

tiding over the period of trial and error which is necessary for solving the problem of finding sufficient long service soldiers for the peacetime regular army.

It is of course not entirely satisfactory to use young N.S. men for foreign service drafts. "Needs must when the devil drives."

Incidentally the Soviets have no hesitation at all in using their young men in precisely the same manner. We are so accustomed to hearing of the hordes of men of which the U.S.S.R. dispose, that the possibility of a manpower shortage in the Soviet republics is never given a thought. But if the needs of industry, agriculture, transportation, and armaments for a gigantic planned economy in a vast and backward country are all taken into account, even a population of 180 millions may hardly suffice for them. But that is by the way.

The cost of using a proportion of N.S. soldiers for foreign drafts adds enormously to the expenditure of sea/air transport, since they can be retained for barely twelve months with their units overseas.

From the training point of view, however, the result of using such expensive reinforcements are admirable. Thousands of young soldiers at an impressionable age are getting a period of military experience, which it would be hard to beat. They recall to mind the young regular officers and men of much the same age who, in the past, went off gaily enough to their regiments in India and elsewhere abroad. But whereas the young hopeful of those days had to sit in durance vile in a far country for anything up to five years, the N.S. man finds himself homeward bound after barely a year. It is not surprising that remarkably few complaints from our youthful adventurers, or their parents, seem to reach the public ear.

The U.S.A. also reinforce their overseas forces on a short term basis. The reinforcement pipe lines thus run very full of men and are also very flexible. Quite possibly they are teaching the Communists the same lesson that proved so bitter to the Axis in World War II, i.e. that sea/air transport has seven league boats. Switching the cold war at will from one apparently "soft spot" to another on crazy railways and bad roads is possibly proving to be not so easy to them in practice as it seemed in theory.

The British military authorities have tackled the administration of National Service with the greatest patience, tact and efficiency. As they gain experience of conscription in peacetime, less will be heard of the claim that money spent on National Service is wasted and would be better employed on forming a long service Regular Army of 250,000 men by offering better financial rewards. The fact is that only National Service will produce the men now, when they are so urgently needed. In these critical years of the nineteen fifties there simply is not time to experiment with complicated plans for making the army more attractive to long service soldiers. The National Service Act produces men at once like the turning on of a tap. If the cold war subsides and the world runs into more peaceful days, the tap can, quite easily be gradually turned off. The Army would then tend to return to its old pattern of a Regular component for immediate security and a Territorial component for the building up of reserves.

Since the burden of National Service is a heavy one, not to be borne for a moment longer than security demands, plans for making the Regular Army attractive as a career both to officers and men have lost none of their importance. They are in fact receiving constant attention.



The Suez Canal, 1952. British troops in a Bren-gun post

THE SIZE AND LOCATIONS OF THE ARMY

The Army which has to be trained is a complicated structure of Regulars, Territorials, and National Servicemen, numbering 555,000 officers and men. Before leaving the general picture to fill in some detail, it will do no harm to stress a point that is often overlooked, i.e. no other member of the Atlantic powers or of the Commonwealth has taken on relatively foremost heavier obligations for defence on land than Great Britain, who is still in the defence of freedom.

At the present time apart from the Territorial Army and a few regular battalions, the bulk of the Army is serving overseas in Egypt, Malaya, Hong Kong, and Germany, between which the equivalent of nearly ten divisions is located.

In Egypt and Malaya the troops are gaining practical training in some modern varieties of the police operations, which the British Army has so often had to undertake in the past. The senior commanders in both these two places have military tasks, overcast with every kind of political filth and agitation, which require consummate judgement, firmness and tact for their successful conclusion. The experience which they are giving will certainly turn them into most valuable specialists in the control of the cold wars and the wars of nerves which may quite possibly take the place of real fighting for a long time to come. Such struggles obviously require bold and skilful treatment. But they do not teach the more senior commanders much about the handling of their formations and units for the possible war in Europe to which their fleeting years of command should be pre-eminently devoted. As a result of this, the senior officers cannot but suffer feelings of frustration in places where police operations are the "pièce de resistance" of their military activities.

For the junior ranks in Egypt and Malaya the training picture is very different. They not only become seasoned to war by the constant menace of peril, but also get continuous exercise in the business of patrolling in small bodies. Nothing could be better for the inculcation of enterprise and cunning. They also learn to co-operate in small parties with armour and aircraft in a way which would not fall to their lot on a set battlefield. New forms of co-operation are learnt and never forgotten. This is all splendid training.

Hong Kong was, and probably still is, intimately concerned with the reinforcement of Korea, from which information about the war there is quickly received and used in training. On the mainland of the colony Brigade exercises of an up-to-date kind are held but training higher than that is necessarily limited to schemes. Hong Kong is militarily speaking rather "a pig in a poke." If it did not suit the Pekin government to permit a British trading depot to thrive on the door step of the Chinese continent, it might become rather difficult. But a general store with its own supply ships is a human and useful institution and merchant venturers of all races, especially the Chinese, have done a roaring good trade there for a very long time. The formations in Hong Kong must be so highly trained as to be a hard nut to crack. The sea/air pipe line of reinforcements makes Hong Kong a far better risk than it was in 1941, when sea power in those latitudes had been won by Japan.

In Korea the forces of the United Nations have to contend with a numerically superior enemy, who is overtopped in the air and at a disadvantage in training and equipment. The U.S.A. and the other United Nations are thus gaining, whether they like it or not, magnificent experience for their soldiery, such as the U.S.S.R., Germany, and Italy, of a set purpose, hurried off to get in the Spanish Civil War of the nineteen thirties. Although no new weapons have appeared so far, the fighting technique of World War II is kept up to date and taught to young soldiers. We learn, for instance, that the Centurion tank can climb considerable mountains and put shells through the loopholes of shelters at 2,000 yards "with monotonous regularity." Quite recently the artillery of the Commonwealth division put down a divisional concentration of all three regiments "in the all time record of 78 seconds" from the moment when the fire orders issued from the O.P. Formations are constantly lifted by air from one place to another as a matter of routine with little or no paperwork. A Royal Marines Commando took part with the U.S. Marine Corps in amphibious operations for the capture of Seoul. The British regimental system has once more triumphantly vindicated itself. Above all, so has the training of British troops.

The Communist attempt to dominate the Korean peninsula has already cost hundreds of thousands of Korean casualties. At the same time crass mal-administration has brought about such dire epidemics that even germs and microbes have had to be branded as a capitalist secret weapon in order to conceal the incompetence of the Reds. Militarily the battle is won. Politically it relapses into the cold war. World progress is still at the halt.

TRAINING IN GERMANY

In so far as the divisions overseas are concerned, that so many of them are located in Germany is a matter for congratulation. There they can be properly trained, whereas life in Great Britain is a far less satisfactory preparation for war. It is so urban and full of pleasant distractions.

Indeed Great Britain, with its many huge towns and its enclosed countryside is, perhaps, the worst training ground for a modern army in the world. Land owners, district councils, and earnest preservers of rural beauty are also apt to put obstacles in the way of the military authorities in their patient search for suitable land on which to train troops and test equipment.

Germany on the other hand is a wide country which has maintained very large armies on its native soil for over a century. There are said to be barracks in Germany for close on a million soldiers with training facilities in proportion. The Soviet troops in the East Zone take a large number of them. A good proportion in the West Zone have been handed back to the Federal government for the homeless and the refugees. But a fair number of fine barracks, with excellent training areas, are at the disposal of the Allied armies of occupation.

Even so, elbow room for training tends to become more difficult to get in proportion as the control of Germany is handed over to the Federal and Länder governments. The Germans have naturally been quick to see how admirably the democratic system of the West lends itself to loud complaints about small evils.

In the days of the Kaiser and of Hitler a district or town was greatly honoured by the construction of barracks or by the training of troops in its vicinity. It would not be reasonable to expect that the troops of ex-enemy countries should be welcomed with quite the same warmth. But in these critical years Allied troops can at least demand to be assisted in every possible way to acquire military skill and efficiency. Only these will cause the Soviets to think twice before deciding to attack the West. Adequate training facilities simply must be provided.

With the increasing number of armoured and infantry divisions of the Western democracies actually located in Germany for her defence, manœuvres on a grand scale for training them are becoming more important each year. The standard of individual and collective training in the B.A.O.R. is steadily improving. Its units are now well accustomed to the intake all the year round of partly-trained N.S. men. They can usefully and without ill effects take part in collective exercises before their individual training is completed, since doing so adds to their understanding of what they are being taught. The B.A.O.R. profits by not being overfull of recruits at certain periods of the year, which it would be if the intakes were seasonal.

The collective training period of 1951 in Germany culminated in the exercise "Counterthrust." The first British armoured Corps ever to take part in the manœuvres in peacetime was exercised for nine days in mobile operations on a wide front against superior land and air forces. A British Infantry division acted as enemy. Troops attached to either one side or the other included formations and units from the American, French, Belgian, Netherlands, Danish and Norwegian Armies. Air forces from several members of the United Nations also assisted the R.A.F. in the air. The armoured Corps withdrew for nearly 50 miles, including the crossing of the river Aller, and finally put in a counter-attack. The concealment of the armour from the air was said to be good, although dispersion on the roads and in harbour was less so. Slit trenches and the practice of local alarms were important features. The mechanical excellence of the Centurion tanks received high praise. That old friend "The warning order" was still found to be a most useful device in any rapidly changing situation. Between the many Allied units engaged, English was the common language of communication. It was used very effectively and almost without comment.

General Eisenhower, Field Marshal Montgomery, and General Juin, with 350 other spectators watched the exercise, which was widely covered by the press both of Europe and the U.S.A. Indeed the American press gave more attention to "Counterthrust" than to their own exercise "Combine" which was held later on in the U.S. zone of Germany. They reported there that judged by the British standards, the camouflage procedure of the U.S. Army left something to be desired. The Commander-in-Chief of the B.A.O.R. commented on the great improvement and the skill of commanders and staffs and in the general standard of training. It would be surprising if this was not so, since the B.A.O.R. is training under conditions, which are more favourable than ever before in the history of the Army. The opportunity is being seized with both hands. The British zone of Germany in 1951-52 is a training bee-hive.

TRAINING IN THE UNITED KINGDOM

Although the United Kingdom and Northern Ireland are now bereft of most of their divisions and regular units, training activities at home in 1951-52 have been considerable. It was only in October that the Egyptian trouble started. In the earlier months of 1951 one armoured and one infantry division had been reconstituted. Exercise "Surprise Packet" was held for their benefit. Like the B.A.O.R. "Counterthrust," it was a training milestone in being the first big exercise held in England since the end of World War II. The two new divisions worked as a Corps against a controlled enemy composed of an Infantry Brigade and a Parachute Brigade of the Territorial Army with some additional attached troops. "Surprise Packet," which lasted for five days, was designed to exercise the Corps in mobile operations involving speed of decision and manœuvre. It also gave opportunities for seizing the initiative. Sufficient air forces were provided to train the troops to be air conscious and also to exercise the staff in demands for air support. Approach marches of sixty miles, making contact with the enemy, defence and counter-attack all came into the picture. The writer was present at the exercise and was favourably impressed with the appearance of the troops. The scheme was an excellent one which achieved what was intended. The Territorial Brigades were composed of officers and men with war experience who were of impressive quality.

Shortly after the successful conclusion of the manœuvres, many of the formations and units concerned were despatched overseas where they have already given a good account of themselves.

Apart from this refreshing example of well-timed military organisation and training, the call up of 200,000 "Z" reservists during the summer of 1951 was a step without precedent in peacetime. They were trained for fifteen days with Regular Supplementary Reserve or Territorial Army units. The big scale of the operation produced many practical difficulties which were all triumphantly overcome. The Territorial and Supplementary Reserve units bore most of the burden and did so with great efficiency. The reservists themselves were keen and put in some hard work. The call-up was acclaimed on all sides as a resounding success.

THE TRAINING STRUCTURE

In the meantime the training structure of the Army at home is at full stretch feeding recruits into more divisions than have ever been embodied in peacetime before. The details of this structure are admirably set out in the chapters on "Army Training and Military Schools of Instruction" in the 1950 and 1951 editions of Brassey's Annual. They need not therefore be referred to in detail except where some radical change has occurred.

It will be useful to examine in a general way some of the problems which confront the individual training system to-day, especially in the training of officers, since success in war is almost wholly in their hands.

So called "soldier's" battles do occur but they are usually costly and inconclusive. That they occur at all is a reflection on the training of the officers. The Crimea which has already been awarded a black mark for bad training had several soldier's battles.

History, however, can be searched in vain for soldiers campaigns. The training of officers is therefore of supreme importance. This is particularly so during an age in which social reformers are attracted by the idea of a "classless" democracy. Karl Marx gave much thought to this ideal and to the violence which would be necessary to attain it. But he does not seem to have laid down any principles for causing the "classless" society to articulate efficiently or for making revolutionary armies effective instruments of violence. Some kind of hierarchy of command is required for both. This fact is of importance in devising the education of officers in a modern democracy.

THE TRAINING OF OFFICERS

Experience has amply proved that if officers are carefully selected their efficiency and success depend more on systematic training than on inherent aptitude. Since World War II much useful progress has been made in the selection of officers. At the same time the education of officer cadets has been radically altered to suit the changed conditions of to-day.

The regular officer to be has to pass ten weeks in the ranks before passing into the Royal Military Academy at Sandhurst. If he appears to be deficient in military virtue, he will not get there, but will, instead, complete his 2 years as an ordinary National Serviceman. At Sandhurst where the future officers of all arms are educated, the course is designed to give them general knowledge and an inkling of the formidable ramifications of the art of modern war. In the past many young men, who otherwise took to soldiering like ducks to water, never worried much about the higher flights of their profession or studied them unless they had to.

The consequence of this habit of mind has been sometimes unfortunate. Officers of great character and energy have risen to high rank without really learning to think. This has caused them to make faulty judgements at critical moments.

The newly constituted R.M.A. Sandhurst will fail in its admirable purpose, if it is unsuccessful in causing its students to think deeply about war and to continue their study of it when they pass on with the Army. In actual fact the soldier has, *ceteris paribus*, a shorter time to practice his particular art than the devotees of any of the others. Goethe often said, rather pleasingly, "die Künst ist lang und Kurz ist unser Leben" but he was able at a ripe old age still to enrich the literature of his country. But in peacetime the young officer with ambition has only a few crowded years in which to gain even the chance of being selected for high command. If he is then lucky enough to get through the ruck, war alone will prove whether he is really a master of his profession. He may be fated merely to demonstrate that soldiering in peacetime is an art with infinite opportunities for taking pains. If a great war comes, few of the senior commanders at its outbreak survive the test, especially in the British Army which so often has to take the field with the odds of numbers and wealth of equipment against it. Heads are apt to roll in every direction. The age of formation commanders drops quickly from the fifties to the forties and even to the thirties. The Company commander of to-day finds himself the general officer of to-morrow.

Never was the metamorphosis more likely to occur than to-day, at a time

when changes of almost every conceivable kind are taking place so fast, not merely armies but in all human institutions as well.

The cold war and the attitude of the Soviets is compelling Great Britain to set up a larger army in peacetime than she has ever before contemplated in her history. The reserve formations, viz. the Territorial divisions require to be at far shorter notice than was barely possible even in 1939. This all connotes an amply supply of good officers, since bad ones are worse than useless. The problem has not yet been nearly solved.

The demand for good company commanders has thus become particularly acute. They constitute the vitally important "middle piece" which makes or mars the forefront of the battle. For one reason or another it is always a weak spot in any army.

Under the prevailing conditions of supply and demand, company commanders will tend to be nearly as young as they so often are in time of war. Nor will this be altogether a disadvantage. If an officer of 23-25 years cannot quickly learn to handle a company with tolerable efficiency, he is never likely to be able to command anything.

But he must be well trained in advance not only in the details of his subordinate task, but also in higher aspects of his profession. Thus equipped he will not only be a far better company commander, but will more easily develop the qualities of a unit or formation commander which may so suddenly be thrust upon him.

The training of young officers to-day is therefore not the leisurely long term problem which, at first sight, it might appear to be. It is on the contrary a short term job of the greatest urgency, viz. to ensure that a large number of young officers of 23-25 years of age are fit to command companies or their equivalents with efficiency. The number of them has to be large since the demand for them may be very great and the wastage from failures and casualties will be in proportion.

The mechanism by which it is hoped to produce the number and quality of the officers required, already exists and is being added to. Every effort is being made to interest the young N.S. officer in soldiering as a career. For success in this matter, much depends on the commanders and staffs of the various training schools at which cadet officers receive their first vivid impressions of military life. More still on the always overloaded unit commanders, who receive the fledglings and complete their military upbringing. Recently there has been a notable swing back to the full use of the regimental system for fostering esprit de corps and the military virtues. The regimental units, rather than impersonal training establishments, must play the main part in training and adding to the regular officers of the Army. Once they have chosen the Army as a career their eventual worth will depend largely on their own efforts. Those who can lead, inspire, and carry conviction to their fellow men are chiefly wanted, not "bookish" officers or the colourless "good officers," who are the despair of writers of confidential reports. Nor will a fair seasoning of tiresome characters with energy and originality ever come amiss to a unit commander who knows his business.

OFFICERS FROM EVERY LEVEL

Before World War I the Army consisted in the main of 5-6 divisions at home, which were the answer to no particular military problem, and the

British complement of the Army in India. Its officers came largely from more or less well-do-do families, who were able to give their sons allowances to eke out their scanty pay (in 1905 an artillery subaltern got 5s. 7d. a day). The average subaltern picked up his military knowledge from his unit which seldom lacked senior officers with experience of war. Officers who could afford it, and there were many of them, spent a great deal of their time on leave. They did not, for all that, waste their leisure. Those who embarked on a course of riotous living soon ceased to be officers. On leave or with their units they led a vigorous outdoor life engaged in every kind of sporting activity. Subalterns disappeared for months at a time to shoot in the Himalayas or in the jungles of Africa. They hunted, raced, played cricket and polo. They explored out of the way corners of the world on foot, bicycle, and every conceivable variety of animal transport. Some of them learned, at considerable cost to themselves, to fly the first aeroplanes and became in due course the pioneers in the R.F.C. before 1914.

Although these extraneous activities took up time and energy which should sometimes have been devoted more generously to their professional duties, their units suffered very little. The science of war 40-50 years ago was much simpler. Their very absence tended to produce that magnificent body of N.C.Os. which was then always described as the backbone of the British Army.

The officers, who spent their leisure so variously, may have lacked the higher training which was rapidly becoming essential, but they constituted a tough core of regimental officers not wanting in the originality and breadth of view which are still so useful in facing the unexpected and the unforeseen. They were also supported by a tough backbone of N.C.Os.

The social changes which have taken place so quickly as the result of two devastating wars have crippled the well-to-do classes and largely reduced the number of officers which they used to provide. The bulk of the officers required for the greatly enlarged peacetime Army of to-day must be recruitable from every level of society. Magnificent officer material exists, but it has to be quarried out and shaped into the right form. in other words a large proportion of officers will stem from the same sources as the N.C.Os. As the Army must have its backbone of N.C.Os., it must continue to keep them sharply differentiated from the officers by giving them clearly defined responsibilities. The officer must, emphatically, not overshadow and swamp the N.C.O. He must be wont often to disappear much in the same way as the officer of 40-50 years ago managed to do with such consummate efficiency.

THE LEISURE OF OFFICERS AND MEN

The leisure of officers is therefore an important matter. It attracts official attention under the heading "Off Parade Training of Officers" in a way that it never did before. The very title implies that officers do not know how to employ their leisure time usefully. Indeed "Brassey's Annual, 1950, in the chapter *Army Training and Schools*" states that a satisfactory answer to the problem has not yet been found.

Any commander who trains troops soon learns to beware of the bugbear of staleness. The tenseness which good training requires cannot be

maintained for more than a few hours in the day. Relaxation both for officers and men is as necessary as sleep. But relaxation must not be idleness nor must it resemble the organized fun of a Butlin holiday camp. Free time implies free will. That should be the key note. If at the same time leisure can be spent in a manner which makes the officers and men better soldiers so much the better. The details of the leisure of the men should be left to the N.C.Os. under the distant control of a few officers. The excessive *watching* of games and sports should be the exception rather than the rule. It should be the sign of a great occasion. As far as it is humanly possible every officer and man should have some study hobby, game or sport to interest him in his free time.

In a world of rising costs the military authorities must see to it that facilities exist which provide the best experience. The British race has contrived most of the games and sports which to-day entertain the modern world. The Army can take its choice of the most suitable.

SOME USEFUL ACTIVITIES

Leaving the question of private study on one side for the moment, a glance is ventured at a few of the outdoor activities, which seem to be of special value to officers to-day.

World War II has shown that landings on a hostile shore have gained in importance as operations of war. Any of the countless activities connected with the sea, rivers and lakes will provide useful experience and therefore deserve encouragement. Gliding in an accomplishment which usefully focuses the attention on perhaps the most important of three elements in which modern war is carried on. The R.M.A. Sandhurst has now its own gliding club. Its old members should be able to continue their gliding wherever they serve, so that if required they may possibly help to repeat on other fields the "D-day" triumphs of the airborne units in the Orne valley.

After World War I Alain, the bitter French philosopher, pointed out sardonically in "Mars ou la Guerre Jugée" that "there is one difficult art without which a man cannot be a brilliant officer and that is the art of riding." Mechanism has robbed this barbed aside of much of its venom. But the horse still looms large in the leisure time of officers. Once almost as great a friend of man as the dog and only lately superseded as a prime mover of armies in the field, stables for him still survive in nearly all barracks. This makes him a most convenient beast for recreation. Seen from the back of a horse, the world at once looks quite tolerable: worries fade: morale is restored.

Some resent his continued presence because, as they allege, he is absolutely and finally out of date. To them horse shows and jumping competitions take up an unconscionable time and inculcate no military qualities. Hunting, racing and polo are so expensive as to be out of the reach of all except the dwindling few who have private means.

These questions are best left to settle themselves. If the horse dies hard, he does so because of the enthusiasm of his admirers. Enthusiasm is an asset. Moreover even now, if armies get pegged out in mountains or bogged down in mud, pack animals are apt to bob up their heads again. So on balance the horse is good for the leisure of officers.

The officer of to-day must not think of distance in terms of a day's march of 15 miles as Napoleon and even Foch were wont to do. His unit of measurement should be about 100 miles, the depth of the modern battle zone. His mind's eye and his maps must conform to it. Without some sort of private car, he will not easily acquire the "coup d'oeil" which must now be able to conjure up with some confidence the country beyond the visible horizon—especially that in rear of the enemy. In other words the more the British officer knows the highways and bye-ways of Europe the better. If the car is ramshackle no matter. He will master the internal-combustion engine. Private cars should therefore be encouraged in the "Off Parade Training" of officers but perhaps not the motor cycle, which still has not altogether lost its sinister reputation.

OPPORTUNITIES TO STUDY

The private study of officers is well catered for. Tactical and technical doctrine is amply laid down in General Staff training manuals, which issue through units into the personal possession of all officers. They are amplified in "Notes and Information of Training Matters." These were first issued by the General Staff after World War I. They are still published every six months and must constitute one of the most remarkable commentaries on training for war which has ever appeared. They make known the changes in tactical and technical procedures which the evolution of new weapons makes necessary.

Old soldiers will learn with interest that the principles of war have been added to. In 1929 there were eight, now there are ten. The newcomers appear to be the principles of morale and administration. Mobility in the old list becomes flexibility in the new. The additions reflect changes in the requirements of war. The Chief of the Imperial General Staff holds an important exercise each year at Camberley to study some military problem of current interest. Reports on its various aspects are distributed to units for study by officers. Similar reports have issued on the manœuvre exercises "Counterthrust" and "Surprise Packet" which have already been briefly described. Officers are expected to study them also. Examinations for fitness to promotion have been again introduced. At present they are only taken by captains for promotion to major.

The War Office continues to encourage the study of languages. The officers serving in Germany have a first-class opportunity of learning German, which is understood throughout Central Europe. The Russians, who were once the best linguists in Europe are now amongst the worst. The language difficulty therefore adds to the other barriers, which unfortunately separate Russia from Western Europe. The study of Russian by those who like difficult languages will reward them well during the next twenty years.

For sometime past, the War Office has published, for restricted circulation in the Army, a half-yearly periodical to which all ranks are invited to contribute papers containing their experiences of and ideas on modern war. People who do so, get valuable practice in expressing themselves, besides calling attention to a large variety of topics of interests to soldiers.

To assist officers in study for the Staff College examination, the War Office has now a liaison with the Metropolitan Services College, whose

whose well-known correspondence courses now get official assistance and approval.

Of military literature on World War II awaiting study there is no end, although a certain amount of perseverance may be necessary to get hold of the most interesting books from the military libraries, especially overseas.

Enough has been said in this survey to show that officers have ample opportunity of private study if they wish to take it. In most units they only have themselves to blame if they do not spend their leisure wisely. But it requires experience to learn how to do it.

THE TERRITORIAL ARMY

In the Territorial Army "Week-end Training Centres" for the Armoured Corps, the Artillery, and the Infantry are now well established. Complete sub-units can pass a useful week-end at these centres, wiping off by doing so eight out of the thirty drills, which have to be done before the annual camp.

National Servicemen completing their active service with the colours are now feeding into the Territorial Army, which will in the not far distant future be up to its peacetime establishment.

The annual camps in 1951 were a great success. They were attended by ninety-five per cent. of the available strength. Men and officers were notably keen and interested.

OTHER CHANGES AND INNOVATIONS

The absence abroad of so much of the Regular Army and the demand for officers and men to fill the new units has resulted in a reduction of the staffs of training schools and establishments by as much as 1,500 all ranks. A great opportunity thus presents itself of pruning and overhauling the whole training system. The tendency to multiply establishments always requires curbing.

The soundest course is to confine training as far as possible to the depots which turn out the officers and men and to the units which receive them. Schools, special to the various arms are also indispensable. Other training installations should be kept to a minimum, great as the temptation may be to follow the line of least resistance by adding a special school for a subject, which is thought to be neglected in units. Officers and men with a unit are at once available for war. Scattered about in schools they are not. Organisation then suffers from a complication which might be avoided.

Few other changes have occurred in the numbers and location of training establishments. The name of the Combined Operations Centre in Devonshire has been altered to the "School of Amphibious Warfare" which describes its purpose more specifically without altering the scope of its work.

Welbeck Abbey has been mentioned in the daily press as a future college for the technical education, as officers, of boys leaving the secondary schools. This far-sighted scheme shows an apt appreciation of both the need for large numbers of technical officers and also the importance of attracting the best young brains of the whole country.

That the medium machine gun is still a potent weapon on battlefields is emphasised by the proposal to re-introduce the periodic concentrations

at Netheravon of the M.G. platoons of infantry battalions. The new peace-time command course for rifle and M.G. has now been issued and should help to raise the standard of marksmanship in the Army. A semi-automatic rifle is, however, long overdue for issue to units. To learn to use the present rifle efficiently wastes time.

Regimental depots are now more intimately concerned with the training of their National Service and Long Service recruits than they were. The period of basic training at depots has been cut down to six weeks for infantry and engineers and ten weeks for other arms and services. After completing their basic training recruits then proceed either to their units in Europe or to one selected regimental depot per infantry brigade for four weeks more advanced instruction. A Colonel per brigade with a small staff co-ordinates the supply of drafts to the units of the brigade overseas. He is to be, usually, a successful commander from one of the battalions of the brigade concerned and will be therefore well aware of their requirements. Other arms and services either have similar arrangements to the infantry or do not have to wrestle with the important niceties of the British regimental system.

An interesting tailpiece is the news that the soldier in training is "conditioned" to a "thirty-seven hour week" on a block syllabus and is thus brought into line with civilian workers.

The great progress made in "Army Training" in 1951-52, however imperfectly brought out in this review, is a fine tribute to the General Staff and the Training Directorates. The manifest growth in the size and efficiency of the Army is the result of unremitting and unheralded hard work spread over several years.

The administration of the National Service Act has produced few real complaints from the public. This does credit both to the British people for carrying the burden so well and also to the Army for making it as light as possible.

A greater reliance on the regimental system shows a wise appreciation of the tremendous moral value of inherited military traditions.

Perhaps more striking than either of these two signs of good stewardship, is the obvious effort to ensure that the organisation and training of the Army shall move in step with the changing social conditions of the country. Nothing is more important.

B. T. WILSON

CHAPTER XXIII

THE TANK IN FUTURE WARFARE

THERE have been only two great revolutions which have radically changed the organisation of armies. The first followed the adoption of the horse as a military animal, and the second the introduction of the internal combustion engine as a military machine.

Before the advent of the horse, city and village militias were organised in phalangial order—that is, into an inarticulated line of men six or more ranks deep, and as fighting consisted in push of pikes, victory depended upon choice of ground and endurance. Because the strength of a phalanx lay in its men maintaining a wall-like front, actions were purely frontal; manœuvring was virtually impossible and so was pursuit. Even more important, because supply depended upon portage, it was exceedingly difficult to maintain an army for any length of time in the field; therefore rapid wars of conquest, as known in later ages, were impracticable, and in consequence wars were little more than raids restricted to clashes between neighbouring city states.

The introduction of the horse, in about 2000 B.C., not only completely revolutionised this primitive warfare but also the character of war itself. First, it radically changed the supply system of armies, for the horse can carry or haul far more than a man, and what is even more important, unlike man, it can normally live off the country. The first great change was, therefore, the extension of the range of action of armies. Secondly, by using the chariot as a means of human conveyance it enabled troops to be brought in a state of freshness on to the battlefield and massed at tactically advantageous points. Thirdly, when the horse was used to mount the soldier upon—which took place long after chariots were introduced—an arm was created which could operate either independently of or in co-operation with infantry and which eventually evolved into two main types, heavy cavalry for shock action and light for reconnaissance and pursuit.

Though these developments covered many centuries, they finally led to a radical change in organisation. The old infantry army of pre-horse days, geared to human muscular power both for fighting and supply, was replaced by an army geared to the muscular power of the horse. Not only was range of action increased, but the introduction of cavalry led to the birth of tactics—ability to reconnoitre, charge, manœuvre, reinforce, and pursue. Arising out of this emerged a new factor, power to surprise, and therefore attack of an enemy morally as well as physically. In all this the point to note is that the adoption of the horse led to the development of a totally different army—a horse-powered in place of a man-powered organisation.

With the introduction of the internal combustion engine, which could supplement or replace horse-power by mechanical power of a vastly higher ratio, the same evolution was to be expected. And had this been grasped at the opening of the present century, when the motor car was

in its infancy and the aeroplane was born, a hypothetical chart could have been drawn showing—very imperfectly though it would have been—the probable influences of the internal combustion engine on military organisation. From it could have been learnt what changes were likely to be needed in order to enhance the power of armies; what could be done, and—as important—what could not be done as things actually were, and lastly what steps should be taken in order to render them possible.

Though no such chart was made, and the changes which so vast an increase of motive power would effect were left to circumstances to dictate, changes nevertheless closely followed those which had arisen after the horse was adopted. The first was the rapid replacement of the draught-horse by the lorry, not only in order to supply troops in the field but also to meet the ever-increasing demands for artillery ammunition. In fact, the great artillery battles of World War I would have been impossible without mechanical transport. The second was the use of the lorry for troop movements, which became increasingly frequent during the above war, and normal in the next. The third was the introduction of the tank, armoured mechanical cavalry, of which two main types were designed, a heavy tank for assault and a light for reconnaissance and pursuit. And the fourth, an enormous increase in opportunity and ability to effect surprise.

Here we have the main ingredients of what may be called a "motorised army"—that is, an army organised round the internal combustion engine. In greater part, such an organisation was visualised within two months of tanks first taking the field. In a memorandum entitled "A Tank Army," Major (now Lieut.-General Sir Giffard) Martel opened his study by stating: "Unless this war ends in a disarmament and a temporary universal peace, there can be little doubt that the present unarmoured and unprotected soldier will cease to exist and a tank army will take his place. A present-day army could never fight an army consisting of, say, 2,000 tanks."

Two years later, when the war ended, such an army was almost in being. Not only was the Allied plan of operation for 1919 based on tanks supplied by cross-country tractors, but the following tracked vehicles were either in existence or were being built: self-propelled guns, supply tanks, salvage tanks, armoured infantry carriers, mine exploding tanks, bridging tanks, engineer and signal tanks: in fact, the main ingredients of a fully motorized army. So convinced was I myself that the internal combustion engine would revolutionize military organisation that, in 1922, I wrote: "In the next great war we may expect tactical organisation to proceed . . . at enormous speed, if muscle be replaced by petrol . . . weapons will become more and more powerful, protection more and more mobile, mobility more and more speedy, and morale, safeguarded by these three, more and more firm. What does this mean? It means that no army will organise for a twenty-round contest, but instead . . . in such a manner that it can deliver . . . a knock-out blow as soon as possible after the first round opens. An army inferior to its opponent in numbers but superior in mobility will stand every chance of knocking out its adversary before he can even step into the arena."

Years later, in 1936, when again considering this subject, I wrote ". . . even under existing circumstances, it is possible for mechanised

arms to overrun a country such as France, Germany, or Poland in a fortnight."

Although in the last war this prediction was dramatically fulfilled, during it a fully motorized army was never created, armies remaining largely in their chariot stage. Even so elementary a question as whether there should be one or two types of tanks was still being debated when the war ended. This was due to confused thinking, arising out of the inability of the soldiers to realise that an army should be organised around the prime motive power of its day.

Let me here recapitulate in slightly different form. A man is not a weapon, he is a one-tenth horse-power creature who can carry weapons or a load, and as long as he is the sole means of carrying weapons or loads, he is the prime mover. Similarly with the horse, it is not a weapon, it is an animal approximately ten times as powerful as man. It can carry a man and his weapons and haul a weapon or a cart. As long as a more powerful motive force does not exist, the horse remains the prime mover. Lastly, as regards the tank, it is not a weapon—nor incidentally is an aeroplane. It is an armoured, self-propelled cross-country vehicle many times more powerful and less vulnerable than the horse. As long as it maintains its supremacy it cannot be other than the prime mover.

Had the soldier before the last war looked upon an army as a complex machine instead of as a bagful of war tools, he would not only have built tanks but also bullet-proof cross-country supply vehicles. He would not have decided to haul his guns with tractors, but would have mounted them on bullet-proof machines, and he would have moved his infantry in bullet-proof carriers instead of in lorries. In short, he would have built his army round the petrol engine, armour, and the caterpillar track, as armies of old were built around the horse, body armour, and the wheel. True, in the last war many of these changes did materialise, but only through force of circumstances and not in accord with an organised pattern—a blueprint of a fully motorised army.

Now it is not my intention in this study to elaborate such a print, for the simple reason that I do not possess the requisite technical and administrative knowledge to do so. Instead, it is to examine certain tank problems which, in my opinion, have an important bearing on future warfare, and which may possibly assist the would-be army designer in devising a fully motorized army.

The problems I have in mind stem logically from those which arose after the horse first became a military animal, and though I will omit increased radius of action, which is now so apparent that to examine it would be platitudinous, I will consider the remaining four: surprise, supply, co-ordination, and independent action. After which I will examine three special problems—war with Russia, night operations, and the influence of atomic weapons on armoured mobility.

Surprise. How to effect surprise is the basic problem in tank warfare, and one which in peacetime is apt to be overlooked, and therefore in wartime to become doubly conspicuous.

After the battle of the Somme in 1916, when tanks first took the field, we were told that it was a mistake to have used them because there were not sufficient to warrant success and their surprise effect was consequently lost. After the battle of Cambrai the following year, in which

tanks played a decisive part, we were told that a similar surprise could never again be repeated. Of course surprise was not lost and of course it could be repeated, and could not fail to be as long as tank armour rendered rifle and machine-gun fire ineffective. That anti-tank weapons modify tank surprise is obvious, but they cannot annihilate it, because the main power of the tank does not rest in its armour and weapons but in the paralysing effect its *mobility* has on the enemy's mind.

In Poland in 1919 the effect of the German armoured assault was immediate, for within forty-eight hours of the initial attack the Polish G.H.Q. was paralysed, whereupon the body of the Polish army fell to pieces. This sudden collapse was not only due to the unmechanised state of the Polish army but, as may be seen in the next great assault on the Netherlands and France, to correct tank tactics, for in May, 1940, the French had greater numbers of tanks than the Germans, as well as tanks of a superior quality.

In this second German invasion a British staff officer, at the time serving in France, on May 19 wrote: "The *Panzers* still drive about at their own sweet will . . . with no main body behind them. No infantry within sixty miles, just motor cyclists and tanks. . . . News that the *Panzers* are in Amiens. This is like some ridiculous nightmare. . . . The Germans have taken every risk—criminally foolish risks—they have got away with it . . . they have done everything that should not be done by orthodox, book-trained, stereotyped soldiers, and they have made no mistake. The French General Staff have been paralysed by this unorthodox war of movement. The fluid conditions prevailing are not dealt with in the textbooks, and the 1914 brains of the French generals responsible for formulating the plans of the Allied armies are incapable of functioning in this astonishing lay-out."

Not only were the French G.H.Q. surprised, but also the German, for on several occasions during the assault *d'outrance* General Guderian was ordered to halt his tanks so that the infantry might catch up!

In this case it may be said that the French tactical collapse was due to faulty tank organisation. Though this defect certainly contributed to German success, in the battle of Tunis in 1943, when the British and Americans were at clinch with the Germans and Italians, identical results are to be seen. At the time of the final Axis collapse a British war correspondent wrote: "Our tanks roared past German airfields, workshops, petrol and ammunition dumps, and gun positions. They did not stop to take prisoners—things had gone far beyond that. If a comet had rushed down the road it could hardly have made a greater impression . . . the German generals gave up giving orders since they were completely out of touch . . . in a contagion of doubt and fear the German Army turned tail . . . and became a rabble."

Again, it was the same in 1944 during the invasion of Normandy, when tanks were called upon to operate in a difficult terrain and were faced by numerous and powerful anti-tank weapons. In August, when General Patton broke through at Avranches and set out on his headlong advance, this is what we read: "'Halt for nothing' was the guiding principle of the armoured columns. . . . Forward patrols [of armour] shot up everything, batteries, headquarters, strongpoints. . . . Disorganisation robbed them [the Germans] of both a plan and the means to carry it out."

Surprise was as potent in 1944 as in 1939 or in 1917; therefore we may conclude that it will remain so, though the means of effecting it will have to be modified, not only according with the terrain but also with reference to the anti-tank weapons tanks will be called upon to face.

What does all this point to? That whatever tank organisation is elaborated in the future, it will be defective unless it permits of violent surprise, and the violence of surprise will in the future, as in the past, be in direct ratio to the mobility tanks are able to develop and maintain.

Supply. The above logically introduce the problem of logistics, that branch of the art of war which embraces transport and supply and which constitutes the basis of strategy and tactics. Because, as Napoleon truly said, "an army marches on its stomach," it follows that unless the speed of its supply services is greater than or equal to that of its fighting arms, the latter cannot make the most of their mobility.

Two examples taken from the last war suffice to illustrate this: namely, the initial German Russian campaign and the 1944 Allied campaign in France.

In the first the Germans were faced by a very different problem from the one they had to solve in France. The depth of Russia was immensely greater, and whereas in France road and rail communications were plentiful and good, in Russia they were few and indifferent. Added to this, on account of climate—rain, frost, and thaw—the season of mobile operations in Russia was restricted to between the months of June and October.

To win the campaign was possible were Moscow occupied before the autumn rains set in, because Moscow is the hub of the entire Russian rail system, and once gained, the supply of the Russian armies would be so crippled that a knock-out blow might have been struck in 1942. The logistical problem was, therefore, how to cross a distance of some 800 operational miles in three months.

As in France, the campaign was opened with an armoured assault, which was so rapid that in twenty-four days some 500 miles were traversed and Smolensk reached. Could this speed of advance have been maintained, there is little doubt that Moscow would have been occupied early in September. Why was it not maintained? Setting aside Hitler's faulty strategy, the answer is, because of the breakdown of the German supply system. The armoured divisions were not fed by cross-country supply columns, but depended on lorry transport which was tied to the roads, and in rainy weather was restricted to the main roads—few in number—because the secondary roads were at once converted into rivers of mud. Further, the motorised infantry divisions, also lorry borne, could not keep pace with the armoured divisions, which neither could nor were intended to hold ground.

After October 10 General Guderian writes: "The next few weeks were dominated by mud. Wheeled vehicles could only advance with the help of tracked vehicles," and "these latter, having to perform tasks for which they were not intended, rapidly wore out." Also he informs us that "corduroy roads had to be laboriously laid for miles on end in order to ensure that the troops received even the limited supplies available. The strength of the advancing units was dependent less on the number of men than on the amount of petrol on hand to keep them going." Lastly,

when winter came, "in order to start the engines of the tanks fires had to be lit beneath them. Fuel was freezing on occasions and the oil became viscous."

The second example is very different, because distance was less, roads good, and climate normal Western Europe summer weather.

On July 31, 1944, General Patton's Third Army broke through the German left flank at Avranches, after which the speed of its advance was such that a supply crisis began to develop. When, on August 17, the Third Army neared the Seine, General Eisenhower informs us that "truck transportation became utterly inadequate to cope with the situation," and, in consequence, aircraft had to be withdrawn from the newly created First Allied Airborne Army as well as from the Strategic Bombing Force in order to supply Patton with 1,000 tons of petrol daily, a figure which soon had to be doubled. "This type of last-minute planning," comments General Martel, "is not the way to organise these vitally important administrative arrangements in fast mobile warfare."

Why did the crisis take hold? The answer is, because air power had been so fully exploited strategically and tactically that, when supremacy in the air was assured, it was found that its administrative possibilities had been overlooked. In fact, it had not been grasped that, because the aeroplane can dispense with roads and because it is the most mobile vehicle in existence, it is the ideal supply transporter when cost does not enter the question. Had fewer bombers been built, and in their stead had General Eisenhower had at his call, say, 2,000 flying four-ton tankers, there need have been no pause west of the Rhine; in which case the high probability is that Berlin would have been entered by the Allied powers long before Christmas.

The following, therefore, are the two most important lessons to be learnt and applied before another war engulfs us: (1) Because armoured forces move on tracks, their supply vehicles must do the same. And (2) because in highly mobile operations road, rail, and cross-country supply may not prove sufficient, organised aerial supply columns must be at hand to feed the chase at a moment's notice.

Granted power to surprise and means to supply armoured forces, I will next turn to the question of tank co-operation and independent action, which are best considered conjointly.

Co-operation and Independent Action. During the last war, and mainly on the insistence of Field-Marshal Montgomery, it was decided that a dual-purpose tank was all that was needed—that is, a tank which equally well can co-operate with infantry and work independently.

This conception, due to confused thinking, was quite unknown to the original tank designers, who worked on the principle that a heavy, slow-moving tank would be required to co-operate with infantry and a lighter and faster one to co-operate with cavalry. What, at the time, was not appreciated was that, though heavy tanks and infantry could co-operate, as they successfully did at the battles of Cambrai and Amiens, on account of the vulnerability of the horse, light tanks could not effectively do so with cavalry. What they could do, however, was to replace cavalry altogether.

Between the two wars this replacement was made—our cavalry regiments were converted into tank regiments and equipped with medium tanks.

But during this change-over, mainly because of its cost, the heavy assault tank faded out of the picture until 1938, when it was resurrected in the form of the Infantry Tank and organised in Army Tank Brigades. At about the same time the faster tanks became known as Cruisers and were formed into armoured divisions. The main differences between these two types were that, whereas the Infantry Tank had a maximum speed of 15 m.p.h. and was protected by armour varying from 78 mm. to 65 mm. in thickness, the speed of the Cruiser was 28 m.p.h. with armour varying between 40 mm. and 20 mm. Both were armed with a 2-pdr. gun.

Meanwhile, late in the field, in order to guarantee the greatest output of tanks, the Germans concentrated on two main models, the PZ-KW III and PZ-KW IV (a close support tank). Both were medium machines with a speed of about 20 m.p.h. the armour of the one varying from 50 mm. to 30 mm. and of the others from 30 mm. to 20 mm. The first was armed with a 50-mm. gun and the second with a 75-mm. With these machines, supported by a large number of six- and nine-ton light tanks, the Germans overran Poland and France in 1939 and 1940.

It was in the second of these campaigns that the British Infantry tanks, under General Martel, proved their worth. Of their action on May 21, 1940, he writes: "This attack was just the type of action for which the infantry tank was intended. There was no case of a long move round, a flank for which cruiser tanks are needed. . . . His tanks [German] were knocked out quite easily," whereas some of our tanks "were hit fifteen times without having any effect on the tank or the crew. When a tank can advance and ignore the fire of the enemy anti-tank guns, a great moral effect is produced. Such a tank dominates the battlefield."

The obvious lesson of this action, that in close-fighting armour and gun power and not speed are the decisive factors, was but partially appreciated by the Germans. Though they reinforced their armour, they continued to use Mark III's and IV's until in Russia, in November, 1941, they came up against the Russian T. 34 cruiser tanks. These machines were more heavily armoured and gunned, and against them the German 37 min. anti-tank gun proved ineffective. "The result," writes General Guderian, "was a panic."

From then on the battle of the types steadily passed from its independent cavalry into its co-operative infantry phase. We produced the Churchill Infantry Tank with armour varying from 90 mm. to 75 mm., and the Germans the Panther and Tiger, the one with from 100 mm. to 45 mm. of armour, and the other with 102mm. to 62 mm. Of the value of these infantry tanks two examples suffice: the break-through at the battle of El Alamein in 1942, and the fighting in Normandy in 1944.

In the first, which was a battle of assault against a prepared position, the cruiser tanks used—namely, the American Grant and Sherman—were not sufficiently armoured, and in consequence suffered heavy casualties. "There is no doubt," writes General Martel, "that if a brigade of Churchill tanks had been available, they could have overcome . . . [the] 50-mm. anti-tank guns quite easily." Actually, only four Churchill tanks were used in this battle. "All . . . were struck many times by 50-mm. anti-tank guns, and there was only one penetration."

Of the fighting in Normandy, Martel says: "The German Panther tank showed its superiority against our Cromwell tank [cruiser] . . . by

having heavier armour in front and a more powerful gun. The ground in Normandy was so enclosed that head-on fighting between tanks was a common occurrence and an advantage to the Panther tank. . . . Our Shermans and Cromwells were no match for them and our Churchills were only a little better. What we wanted in this type of warfare was the new design of really heavy infantry tank which we had always asked for, but this was not available. Future operations, however, showed that the Panthers were equally unable to hold up our armoured divisions [cruisers] when it became a war of movement in open spaces.

The conclusions to be drawn from these two examples, and others could be added, are that, whereas in position warfare armour and gun dominate, in mobile warfare it is speed which does so. This truism, which should never have been lost sight of, has now been accepted, for our present policy is to build three main types of tank, a cruiser, an infantry tank, and a light tank. Therefore, in idea, we are approximately back to where we were in 1916-18, and can design for the future on the proved logic of the past.

War with Russia. This being so, our tank problem is no longer a question of types; instead it is one of proportion between types *vis à vis* Russia, our most formidable potential enemy; and the answer must be sought in the tactics and organisations of the Russian army. What are the facts?

The first is, that the power of the Russian army derives from its mass, and not from its mobility: it is a quantity army and as such it stands unrivalled. The second is, in order to prevent congestion of supply, mass compels movement over a wide front. And the third, which logically springs from the second, is that Russian offensives are nearly always launched on extensive fronts. They may be compared to inundations which peter out against stubborn resistance and flow through at weak points. They seek the lowest tactical levels, and normally are, therefore, slow and percolative.

Like all past Oriental armies, the Russian is composed of two categories of troops, a *corps d'élite* and an armed horde. The first is *par excellence* the fighting instrument; the horde is secondary to it, and should the enemy's resistance be negligible, is the occupying instrument which, by flooding over the territories conquered by the first, holds them in submission by terror.

The existing *corps d'élite* is composed of heavy tanks and picked infantry working in close combination. The horde, of infantry, cossacks, etc., largely depends for supply on horse-drawn vehicles. Though in dry weather the expanses of Russia enable horse transport to move across country, in the highly cultivated and urbanised areas of Central and Western Europe, many of which are also mountainous, masses of horse-drawn vehicles are road-blockers.

Because both categories of troops have to be supplied, it follows that the greater the horde the more complex becomes the supply of the *corps d'élite*. Therefore, that the Achilles heel of the latter is to be sought in its supply system. To-day this holds good more so than in the past, because petrol-fed vehicles cannot live on the land; throughout they have to be supplied from the rear.

Without supply—particularly petrol and oil—the Russian *corps d'élite*

becomes inoperative. Therefore the problem is, not how to defeat it by superior strength, but by superior tactics: (1) How to slow down the *corps d'élite* by an elastic frontal resistance, and (2) how to break through the Russian front at selected points and paralyse the communications in rear of it. Otherwise put, how to cut the *corps d'élite* off from its supply.

So far as tanks are concerned, the first of these operations demands machines which can deal with the heaviest Russian tank, also powerful self-propelled artillery and large numbers of mobile anti-tank weapons. The second demands tanks of the highest mobility as well as motorised infantry. Both should be supported by powerful tactical air forces.

It may be said that the Russians will be able to establish so formidable a battlefield that a break-through, such as witnessed in France both in 1940 and 1944, is no longer possible. But it should not be overlooked that at the opening of a war conditions are generally more fluid than later on. The reason is that the sudden change over from peace to war is followed by an experimental tactical period in which no one from commander-in-chief to private soldier is certain of himself and in which friction is prevalent until operations are run in. The psychology of an untried army differs from that of a saluted one, and though, when a war is well ground in, setbacks appear at their true value, at the opening of a war they are apt to be exaggerated. Thus, for instance, should the Russian armies, on taking the field, suddenly suffer an unexpected reverse, its effect, not only on their leaders and their masters in the Kremlin, but also on the satellite and subjugated peoples, might well prove catastrophic.

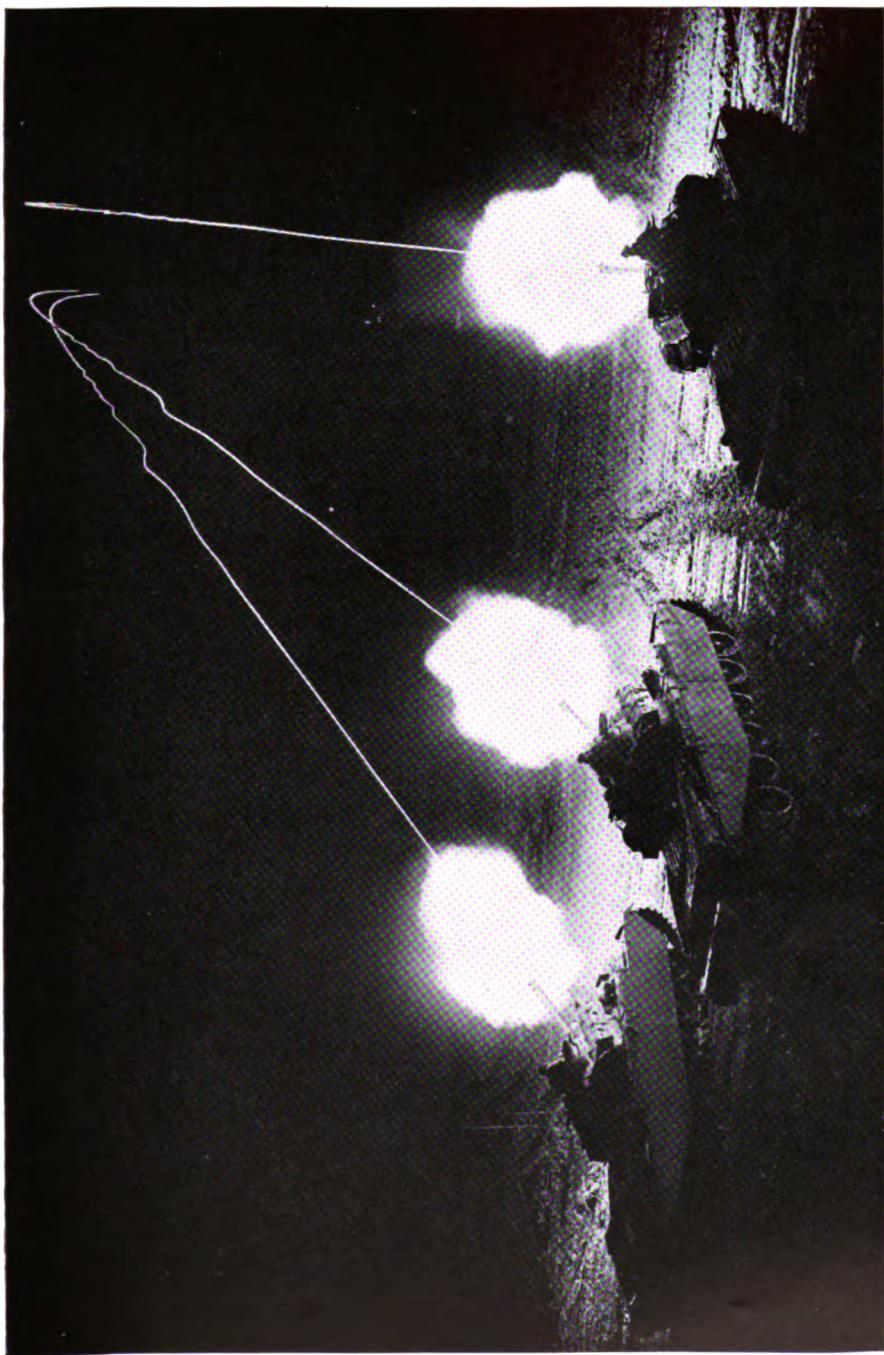
To repeat the tank tactics of the last war, whether on the lines of Guderian in 1940 or of Patton in 1944, is not sufficient, for copies seldom equal originals. Something novel and surprising is, therefore, needed.

Night Operations. To-day the only tactical field which remains largely unexploited is night fighting. Once armies went into winter quarters and cut down their operational year by six months. Still armies go into night quarters and cut down their operational day by twelve hours. When are soldiers going to tumble to it that an army which can fight round-the-clock has a hundred per cent. advantage over one which can fight only halfway round it?

This problem was tackled before the last war and led to the invention of the C.D.L., a tank fitted with a powerful projector of special design emitting a fan-shaped, flickering beam of light which illuminated a wide field and dazzled the eye. The projector was protected in such a way that it could not be put out of action by anything less than a direct hit with a shell which could penetrate five inches of armour.

The purpose of this weapon was to solve the problem of night fighting on a large and organised scale, enabling an attack to be carried out more methodically and rapidly than during daylight, and far more economically and securely; for whereas the field over which the attacker advanced was brilliantly illuminated, all the defender was able to see was a wide expanse of dazzling light which obscured everything behind it, and which was so brilliant that it rendered aimed fire by eye impossible.

That the C.D.L. was considered of value is proved by the fact that two brigades of C.D.L.'s, one of three battalions and the other of two, were raised in England, as well as two Armoured Groups, each of three battalions, in America. Nevertheless, though prior to D-Day (June 6, 1944)



British Centurion Tanks in action at night

the 1st (C.D.L.) Tank Brigade and the 10th (C.D.L.) Armoured Group were fully mobilised and ready to proceed overseas, so little interest was taken in the new weapon that it was not until August 11 that the first of these formations was landed in France, the second following eleven days later. Even then, instead of being used in the operations following on the break-through of the U.S. Third Army, operations in which the Germans could seldom move except under cover of night, the six battalions were never moved forward from their disembarkation camps and were gradually disbanded, as were the rest.

Though the C.D.L.'s have long vanished on the scrap heaps, the idea of turning night into day still offers endless tactical possibilities, the most obvious being the ability to break through an enemy's front under cover of darkness and put *blitzkrieg* into pyjamas. If in the last war the French generals were paralysed by the German tanks in broad daylight, what would have been their state of mind had it been possible for the latter to operate even more freely during the night than during the day, and thereby establish a round-the-clock *blitzkrieg*? Transfer this possibility to the situation now facing us, and a solution to the problem of how the Russian front can be penetrated and its rear services thrown into panic becomes apparent. Thus we return to the basic tank problem—surprise.

Atomic Warfare. Lastly, as regards atomic weapons, what influence will they have on the tank? One thing is certain, their introduction will enhance the value of mobility, because rapid dispersions and concentrations, such as can be effected with cross-country vehicles, will become doubly necessary. Further, as the 1951 tests in Nevada have shown, armoured vehicles are more immune to blast, heat, and radiation than unarmoured. Therefore of all forces armoured ones are the least vulnerable on the atomic battlefield.

The deductions to be drawn from this are that, in future warfare, armies should not only be armoured but, in order that they may be able to disperse and concentrate with extreme rapidity, they must be capable of developing a far higher mobility than in the past. On this question Major Lamar McFadden Prosser writes:*

“Forces must concentrate only at the critical moment of action and disperse rapidly thereafter. At this critical moment, and only then, should the force offer a profitable target for atomic weapons. The swiftness of the concentration must introduce the element of SURPRISE and so reduce the danger of atomic annihilation.”

Further, he adds: “All now seems to hinge on mobility. The speed of manœuvre now demanded may require that all ground forces be mounted. The assembling of regiments of foot soldiers is much too time-consuming and would certainly reduce the possibility of surprise and increase the time of vulnerability. To mount the infantry in trucks (so-called motorised divisions) is to remain road-bound, and this would be fatal. The answer seems to be tracked vehicles. Whether or not these vehicles should also be armoured, introduces problems too numerous to be settled without experimentation. But that all troops will be mounted in tracked vehicles appears to be inevitable.”

Thus we reach the summit of the second great revolution in the organisation of armies.

* *Armor*, Vol. LXI, no. 1. January–February, 1952.

Conclusions. Finally, what does all this point to? That, though tactical essentials remain constant, unceasing readjustments of means have to be made in order to meet the changing conditions of war. The soldier has still to hit, to guard, and to move; he has still to endure, to be supplied, and to surprise. New weapons do not change these things, but how to effect them is always changing.

Fear of the atomic bomb may abolish war by making it appear too unprofitable to wage; but as long as wars continue, though this annihilating weapon will change methods, it can no more change the essentials of tactics than did the discovery of gun-powder. The soldier will go on hitting, guarding, and moving. Without endurance he will be un-nerved; without munitions and food he cannot fight, and surprise will remain for him his staunchest friend and most deadly foe.

Though the roots of future warfare are hidden in the past, the plant of war must be cultivated creatively. No stereotyped copying is likely to succeed. Victory is to be sought in the imagination.

J. F. C. FULLER

CHAPTER XXIV

THE NEW HOME GUARD

THROUGHOUT OUR history at moments of our country's peril, volunteer, part-time, unpaid forces have arisen, formed by the spontaneous desire of able-bodied citizens to arm themselves for the defence of the Realm and to organise, discipline, and train themselves for the more effective performance of that duty.

Thus it was that in the closing years of the eighteenth and at the outset of the nineteenth century when the invasion of Britain had begun to be considered a serious possibility by the public, and had indeed happened on a small scale at Fishguard in 1797, units of the Volunteer Force sprang up throughout the country.

A contemporary table shows units in every county with a total strength of some 360,000. Mr. Pitt after his fall from office in 1800 commanded the unit at Dover. There was, it appears, no intention of mobilising the members of this force for full-time duty unless an invasion actually took place; in this the volunteers of 1800 differed from the Volunteer Force which was formed in the late 1850's and early 1860's to meet the threat of invasion by Napoleon III. This force, the direct ancestor of the present Territorial Army, was under obligation for full-time service at a much earlier stage of the emergency, and though only selected volunteers were mobilised in the South African War, the whole of the Territorial Force was embodied in August, 1914.

During World War I a Volunteer Force was again formed on a voluntary, part-time, and unpaid basis, and though it did most valuable work, for example in guarding vulnerable points, it never attained the highest degree of national importance in numbers or in national estimation. This was largely because there never was a time, even before Jutland, when a German invasion of Britain was considered a serious possibility. The Royal Navy controlled the seas, and the development of aircraft for the landing of personnel was still in the future.

Something of the same mentality prevailed in 1939. No operations were taking place in Western Europe, and the nation had yet to appreciate the full meaning of air power. They did not do so till 1940. Without superiority in the air the Navy could no longer deny the narrow seas to the enemy. The demonstration of German air power which accompanied the beginning of operations on May 10, and had already been seen in Norway a month before, made it abundantly clear that actual invasion by the enemy was possible and, therefore, if the Allied forces were defeated in North-West Europe, highly probable.

There is no doubt that this idea occurred simultaneously to a great number of minds between May 10 and 13, 1940, though apparently no detailed plans had been made by the military authorities. Notwithstanding this, Mr. Anthony Eden, who at the time was Secretary of State for War, decided to make a broadcast appeal for "able-bodied men between the ages of 17 and 65" to form themselves into companies of Local Defence

Volunteers. The task of local organisation was laid on the Lords Lieutenant of counties, the police, and the Territorial Association.

The response was overwhelming, and surprised even the most optimistic supporters of the idea. By the end of June, 1940, the numbers had reached 1,000,000, and a peak figure of 1,700,000 was reached in late 1941. In July, 1940, the name was changed from Local Defence Volunteers to Home Guard, largely, it is believed, at the instance of the Prime Minister, Mr. Churchill. Regulations were published under the Defence of the Realm Act which established the status of the Home Guard as part of the Armed Forces of the Crown though not as part of the Army. Their status under the Hague Convention was thus made clear.

The Home Guard had been placed at the outset under the operational command of the Commander-in-Chief, Home Forces, and for administration under the War Office. Shortly afterwards officers of the Home Guard were granted the King's Commission in the usual Army ranks.

The problem of equipment was not easy, for by 1939 the stocks of rifles remaining after World War I had disappeared, and few rifles of British type were available. Fortunately, however, some 800,000 American rifles were provided on Lend-Lease, and as time went on Sten guns and other weapons became available, so that at about the beginning of 1943 the objective had been reached of "one man, one weapon." Other weapons had appeared such as shotguns, pikes, the issue of which latter was never popular, and anti-tank weapons, largely improvised at first and later of more professional design.

Training schools were set up, at first under private enterprise, such as that at Isleworth, which was later taken over by the War Office and moved to Dorking. These specialised in the types of warfare, such as ambush and street fighting, which the Home Guard might expect to undertake.

After the Battle of Britain in September, 1940, the prospect of invasion by sea began to recede, and as our air superiority steadily grew the possibility of large-scale parachute landing likewise diminished. New tasks, however, awaited the Home Guard in assistance to Civil Defence during and after the severe air raids on large cities such as Bristol, Manchester, and Glasgow, and the task of guarding vulnerable points remained highly important.

Ever since machine guns had been available for factory defence their manning had become a Home Guard duty. In 1942 Home Guard anti-aircraft batteries were set up under Anti-Aircraft Command. These batteries were equipped with rocket projectors. Later, in order to free Regular soldiers for service overseas, Home Guard personnel were introduced into heavy anti-aircraft batteries.

There were also a number of Home Guard transport columns.

The Home Guard were allotted many responsible tasks connected with the assembly of troops for the landing in France of June, 1944, such as the guarding of communications and security duties. By the autumn of that year Allied forces had cleared France and Belgium of the enemy and it was evident that the threat of invasion by sea or air was now removed. In November, 1944, therefore, the Home Guard was "stood down" and its activities ceased.

It has represented a most notable national effort. At the peak its strength was 1,700,000 all ranks. Some five to six million men had served

in it at one time or another. There had been over 1,000 battalions and over 100 anti-aircraft batteries besides other units.

For the first period after the war it was generally thought that the establishment of the United Nations would result in the preservation of peace, but from 1947 onwards it became clear that if another war was to be foreshadowed preparations for defence by the Western Powers would have to begin afresh.

In 1948, therefore, the Civil Defence Organisation was re-established, and the necessary powers for recruitment of part-time volunteers were taken in the Civil Defence Bill. Many people thought that the Home Guard should have been re-formed at the same time. Why this was not done is a matter of conjecture, which cannot be discussed here.

In 1951, however, some preliminary steps were taken and a survey made of the requirements which a reconstituted Home Guard might be designed to fulfil. No statutory powers were, however, taken up to the time of the General Election of 1951. By then public interest in the matter had been aroused, partly by certain incidents of sabotage, enough for the re-establishment of the Home Guard to figure in the election manifesto of the Conservative Party.

After the election, therefore, the Home Guard Bill was introduced into Parliament and received the support of all parties on the Second Readings, being discussed at great length at the Committee stage in the Commons.

The discussions in the Commons were designed to safeguard the position of the individual in regard to trial by court martial, and to make illegal the use of the Home Guard in industrial disputes. It is worth recording that apparently neither of these matters had caused serious difficulty in 1940-44, the total number of courts martial then having been as low as 220, while attempts to use Home Guards in industrial disputes are believed to have been made on two occasions only.

The Home Guard Act, generally speaking, reintroduces the original Defence Regulations of 1940 in the sense that it provides for the Home Guard to be part-time, voluntary, and unpaid. It provides, likewise, for the Home Guard to be part of the Armed Forces of the Crown, though not part of the Army, and for its members when on duty to be subject to military law. It envisages the grant of Queen's Commissions to Home Guard officers, a step originally taken not at the start of the Home Guard but at the end of 1940 in response to widespread feeling by all ranks. His late Majesty King George VI assumed once again the appointment of Colonel-in-Chief of the Home Guard.

Although, however, the constitutional and administrative framework of the Home Guard is the same as in 1940-44, the operational requirements differ in some important respects.

In 1940 a major seaborne invasion had been envisaged. Such a threat is unlikely, though small-scale raids remain a possibility. Developments in anti-aircraft defence have, if only for a temporary period, removed the need for Home Guard anti-aircraft units, but later on the anti-aircraft role may perhaps be given greater importance, if only because of the moral value of a visible factory defence.

For the present a threat to the United Kingdom from a potential enemy might develop in the following ways. First, sabotage of vital installations or communications. Action of this kind could take place during a "cold

war" and need not wait till actual hostilities begin. Air superiority is not essential for its success, but once the enemy achieves it, even for a short period, parachute or air landings could be carried out with the object of occupying vital airfields or other important vulnerable points.

There is also the probability of air bombing directed against civilian targets as opposed to those of purely military value with the object of weakening the national will to resist. This is the province of the Civil Defence Services; the Home Guard, like the Regular forces, must be prepared to help whenever called on and must be trained and organised in advance to do so.

To deal with the first or sabotage type of threat an adequate scale of guards and patrols is essential. To deal with air landings it is vital that the newly landed troops, who will be highly trained Regulars, should be attacked before they have had time to organise and to get their bearings. It is here that the Home Guard can be of the greatest service. If we were to rely on Regular troops for this duty the numbers required would be excessive, and, furthermore, could only be provided at the expense of our field forces overseas.

Although, therefore, much can be and has been done by organising mobile columns from training and administrative units at home and from the ground staff of home-based R.A.F. units, the use of the Home Guard will clearly strengthen the defence, and by its nature will enable some degree of coverage to be provided even in sparsely populated areas. An official War Office announcement speaks of "a deep defensive belt with posts manned by determined infantrymen." It is with this requirement in mind that the new Home Guard has been planned.

Clearly the methods employed cannot be the same as in 1940, under the imminent threat of invasion and the pressure of an intense desire to serve. This time it is a deliberate operation undertaken in cold blood. At this stage large numbers are not required, and, indeed, are undesirable; since the urgency of the immediate tasks is not obvious to the rank and file, an anti-climax might well set in with all its dangers to morale. At this stage careful planning, reconnaissance, and selection of leaders are required and the ranks need only be filled in that part of the country which is more exposed to enemy action.

For this reason plans are based on a total of 900,000 Home Guards in wartime, not much more than half the peak figure of 1940-44. East of the line from Flamborough Head to Selsey Bill, excluding London, Home Guard battalions will be raised to effective strength from the start, to a total of 100,000 men or about 900 a battalion, armed with rifles or Sten guns. West of this line battalions will be on a cadre basis, and will at present be limited to 50 men a battalion. Their task will be that of preparation, reconnaissance, and leader training.

Enrolment began on April 28, 1952, but at the time when the Home Guard Bill was first introduced in Parliament it was made possible to register for enrolment by filling up a postcard available at Post Offices. By April 2, 1952, 33,508 men had registered according to a statement given in Parliament.

On March 14, 1952, the Regulations for the Home Guard were laid before Parliament. Like the Act itself, they are to a great extent a reproduction of the wartime Regulations, which indeed had stood the test of time.

Control in the War Office rests with the Director, Territorial Army and Cadets, who is the adviser to the departments of members of the Army Council on Home Guard questions. Thus, the chain of command will, as before, go through G.Os. C.-in-C. of commands and through Headquarters United Kingdom Land Forces when it is formed.

Local administration, as before, will be carried out through the Territorial and Auxiliary Forces Associations. Thus, once again, the Home Guard will be organised on a county basis, and as evidence of this will wear the cap badge of the county regiment.

Sector commanders with the rank of colonel will be appointed for groups of between two and five Home Guard units, and these may be Regulars or Home Guard officers according to circumstances.

Once again as in 1940, the Home Guard will be a part-time, voluntary, and unpaid force. No mention is made in the Act of any compulsory enrolment, though in the course of the last war this had to be introduced and would no doubt prove necessary again in an emergency. Travelling and subsistence allowances are again to be given to meet out-of-pocket expenses.

The Home Guard will carry out its normal duties as a part-time force. Indeed, it could not do otherwise without serious dislocation of industry and agriculture. But provision has been made for the Home Guard to be "mustered," that is to say placed temporarily on a full-time basis "for the purpose of resisting an actual or apprehended attack by a foreign power, or of taking part in measures for dealing with the effects of such an attack." At ordinary times, that is when the Home Guard is not mustered, a member of the Home Guard may be ordered to perform a minimum of fifteen hours' training and/or duty in any period of three calendar months. He may voluntarily perform more than the minimum. The amount of training or duty actually performed will clearly depend on circumstances.

The ages of enrolment have been laid down as "between 18 and 65 years" and a "reasonable standard" of physical fitness is demanded. The details of the rules for eligibility and enrolment follow closely the 1940-44 rules and broadly speaking provide that no one with a liability as a Territorial or Reservist may join the Home Guard unless he is specifically made available for the purpose by the War Office.

A new regulation which meets the need of peacetime provides that enrolment shall be for two years, with re-engagement up to 65, if physically fit, subject to one month's notice.

Another regulation, reaffirming an undertaking given in Parliament in the late war, lays down that a member of the Home Guard will not be required to carry out duties in connection with an industrial dispute. Likewise, the disciplinary arrangements are similar to those in the last war. A member of the Home Guard when on duty or when mustered is subject to military law and can then be tried by court martial. An officer or warrant officer can be dealt with summarily under Section 47 of the Army Act, but N.C.Os. and men cannot be given summary punishments under Section 46 of the Army Act except when mustered.

There is a regulation prohibiting members of the Home Guard from attending political meetings in uniform. Detailed administrative regulations have been published but call for no special comment.

Commissions are to be granted under the authority of the Order in

Council of 1941, which is still in force (The Home Guard Commission Order 1941).

It has been announced in Parliament that women will under certain conditions and for certain duties be allowed to join the Home Guard. Regulations for this have not yet been published. This arrangement differs from that of 1940-44, when women were not permitted actually to join the Home Guard, though women Home Guard Auxiliaries were allowed for non-fighting duties.

It is too early as yet to estimate the success of this scheme or to comment on its progress. Already, however, a number of men with experience of the Home Guard in 1940-44 have accepted appointments as battalion commanders, and recruitment of Company Commanders and junior leaders is believed to be proceeding steadily throughout the country. It is probable, then, that notwithstanding the inevitable differences in tactical role and therefore in training, the morale and mentality of the reconstituted Home Guard will resemble what was best in the Home Guard of 1940-44.

The basis and the background remain the same: a part-time, voluntary, unpaid force for home defence in the greatest possible depth.

BRIDGEMAN

CHAPTER XXV

THE TASK OF THE ROYAL AIR FORCE

THE BACKGROUND TO EXPANSION

WHEN, following the invasion of Korea on June 25, 1950, the progressive reduction in the strength of the armed forces which had been in progress since the end of the war was halted, the Royal Air Force, like the other Services, was in no shape to commence expanding. Not only had the strength been reduced from the wartime peak of 1,186,000 to 215,000 in 1950, but the great majority of the experienced N.C.Os. and men, on the "first in, first out" principle, had returned to civil life. There was thus no body of experienced men on which to expand.

On the material side, however, the position was not quite so bad. Already, in 1949 and 1950, as a result of the deterioration in the international situation, there had been increases in the Air Estimates of £34 million and £16 million respectively, which were almost entirely due to increased expenditure on aircraft and stores, although the personnel strength was continuing to decline.

Some modest steps had therefore been taken for the re-equipment of the Force with modern aircraft when, after the aggression in Korea, the decision to expand the forces was taken. The Government of the United States was informed in a Memorandum dated August 3, 1950, of the measures which we proposed to take. The new programme then put forward increased the proposed defence expenditure to a total of £3,400 million over the next three years, or an average of £1,100 million a year, compared with the original estimate for 1950 of a total of £780 million.

It should be remembered that this expansion programme followed hard upon the Government's efforts at the end of 1949 to effect widespread economies in the Services following the completion of an inter-Service review of the future roles of the three Services. Thus, at the very moment when the decision to expand was taken, an accelerated run down was in progress, a process that had to be put into reverse, and which, not unnaturally, did not make the task of expansion any easier.

The £3,400 million programme outlined in the Memorandum to the United States was followed by the Prime Minister's Statement on Defence on January 29, 1951 (Cmd. 8146), when the amount to be spent in the following three years was increased to £4,700 million, £1,300 million of which was to be spent in 1951-52. This is the programme which is still in force but which has been found beyond our capabilities to fulfil within the three years originally envisaged. At the same time, there has been a substantial rise in prices, so that the programme, if completed in its entirety, will cost considerably more. In addition to the production difficulties which have slowed down the programme, the rate of progress has been adversely affected by the worsening of the economic position, and it looks as though the date of completion will now be considerably later than March 1954, the date originally contemplated

Additional measures to increase the manpower in the Services had already been taken before the Prime Minister's Statement, when, in September, 1950, the period of National Service was raised to two years, and at the same time, in order to improve regular recruiting, substantial increases were made in the pay of the Services.

This is the background against which the expansion of the Royal Air Force has to be visualised, and which led to an increase in strength to 238,000 in April, 1951, with an estimated expenditure of £329 million. This year the estimated strength in April, 1952, had risen to 270,000, and the expenditure to £467 million, towards which the United States Government is to contribute £30 million out of the sterling counterpart funds. By April, 1953, it is estimated that the strength will have risen to 297,000.

The main problems confronting the Royal Air Force when faced with the expansion programme were that the Force was equipped with obsolescent aircraft (which in any event were insufficient in numbers to meet the requirements of expansion), there was a great shortage of experienced officers and men, the aircraft industry was too small to meet the demands likely to be made upon it, and the training organisation, both for aircrew and ground tradesmen, would have to be greatly expanded.

In addition, a large programme of airfield construction and building was necessary to accommodate the expanding Force. There were also the requirements for airfields for the United States Air Force, and, to a lesser extent, for the Royal Canadian Air Force, in the United Kingdom, and we also had to provide a proportion of the airfields required in Europe for the Allied Air Forces. All these various requirements imposed a heavy burden on the already overstrained building resources of this country.

Then, apart from the immediate problem of expansion, there was the subsidiary problem of building up the reserves of aircraft and men that would be required in war.

AIRCRAFT PRODUCTION

The main difficulty confronting the Air Force was undoubtedly the aircraft position. It was of little use to increase the manpower if the aircraft to match them were not available. Additional aircraft were required not only for the re-equipment of existing units and the formation of new ones but to train the large numbers of aircrew necessary for the expansion programme. On the design side the position was reasonably satisfactory. There were several new types of aircraft coming along, such as the Canberra and the Valiant, and practically ready to go into production, but for various reasons the aircraft industry has been unable to meet the greatly increased requirements.

There have been three main reasons for this state of affairs, namely, shortage of manpower, materials, and machine tools. Of these the shortage of manpower is much the most serious. When expansion started some 150,000 people were employed in the aircraft and allied industries, whereas almost double this number was required if the programme was to be met. Various measures have been taken by the Government to encourage the transfer of workers from the less important industries to those engaged in rearmament, but by the beginning of 1952 the numbers

in the aircraft industry had risen to only 177,000, and it was estimated that at least another 50,000 would be required to meet even the slower rate of expansion now visualised.

As a result, although we probably still lead the world in the design of aircraft, we are unable to produce them in sufficient numbers to re-equip our forces, and have had to obtain aircraft from the United States and Canada to make good our deficiencies. In 1950, for instance, a number of B.29 bombers (Washingtons) were obtained to bridge the gap until the Canberra and Valiant were available. Towards the end of 1951 P2V-5 Neptune aircraft were ordered as part of the re-equipment and expansion of Coastal Command with anti-submarine aircraft. Then, early in 1952, it was announced that Britain, the United States, and Canada had agreed to combine their resources to produce, equip, and man squadrons of Sabre jet fighters. Canada is already equipping her fighter squadrons with Sabre aircraft built in Canada, and now the Royal Air Force is to be equipped with Sabre F86E fighters also built in Canada, but financed by the United States as part of the military aid programme. This will help to re-equip our fighter squadrons with up-to-date aircraft until such time as our own experimental types of fighters are in production.

It does therefore appear that should war come the Royal Air Force would have to rely, as in the last war, to a considerable extent on supplies of aircraft from the United States and Canada, as our own aircraft industry is at present unable to meet the demands of expansion, and would still less be able to provide aircraft in the numbers required in war.

MANPOWER

Up to the end of 1950 all three Services were experiencing great difficulty in recruiting the numbers of men required, but fortunately a great change took place just as the expansion programme began to get into its stride. This improvement was partly due to the introduction of increased rates of pay, which brought about a substantial rise in the rate of Regular recruiting, and partly to the lengthening of the period of National Service, which both increased the numbers of men serving and meant that the Services were able to make better use of them during their period of call-up.

In addition, as far as the Royal Air Force was concerned a third measure was introduced. This was a new trade structure which provided careers and an additional means of advancement for all tradesmen up to the age of 55, whether or not they were likely to make good N.C.Os. At the same time re-engagement bounties were introduced and a scheme for short three-year engagements, which all helped to improve conditions for the Regular, and hence to attract recruits. All these measures combined with undoubtedly greatly improved recruiting, and at the same time they helped to persuade the more experienced men to extend their service.

Although there is now no manpower shortage as such in the Air Force, there is still a shortage of highly skilled men in certain trades. Only time can remedy this deficiency, but the position is gradually improving as many more men are now extending their service.

The aircrew position is also now reasonably satisfactory. National

Servicemen in the numbers required have been volunteering for flying duties, and although they do not serve long enough to give much productive service in the Regular force, they are of great value in building up the Reserve. Volunteers are also coming forward well for Regular flying service, largely owing to the introduction in 1951 of a new four-year engagement, and they will also contribute to strengthening the Reserve when these aircrew commence to pass to the Reserve in 1955.

TRAINING

The problem of training the increased numbers of ground tradesmen required was not so difficult to solve, as they could be trained in a much shorter time than aircrew, and so the build-up could be spread over a longer period. In addition, the necessary training schools already in existence were capable of considerable expansion to deal with the increased intake.

The training of the additional numbers of aircrew was a much more difficult problem to resolve. It takes eighteen months to two years to produce a fully trained pilot, the class of aircrew that takes longest, assuming the necessary facilities are available. Before the additional aircrew could be accepted for training the flying training organisation had to be expanded, and as this involved the re-opening of airfields and the provision of more aircraft for training, which themselves take probably a couple of years to produce from the time the order is placed, it is clear that the production of aircrew in the numbers required is a lengthy process.

At the same time, the phasing in of the training of the aircrew with the production of the aircraft is an extremely complicated affair, and it is almost impossible to prevent the two from getting out of step from time to time. Hence the complaints which inevitably arise that the aircrew, having been trained, are not all being employed, or alternatively, having volunteered, that they are not immediately absorbed into the training machine.

Another difficulty in the training of aircrew is that there just is not room in this country for the flying training organisation and for the operational squadrons. Furthermore, if it can be avoided, the training organisation should not be located where it is within easy range of attack. Hence the reason why so much of the flying training during the war was dispersed overseas in such countries as the United States, Canada, South Africa, and Rhodesia. The drawback to using these areas on a large scale again is that it takes much longer to build up the facilities required there than at home. We have therefore been compelled considerably to expand the training organisation in the United Kingdom, in spite of the strategic disadvantages, as only in this way could aircrew in the numbers required be trained in time. There are, however, already flying training schools in Rhodesia. It should be possible gradually to expand these schools, and to build up new schools there and elsewhere. In addition, some aircrew are being trained in Canada, but the possibilities of increasing the numbers there is limited by the fact that Canada is undertaking the flying training of a number of aircrew for some of the other countries of the North Atlantic Treaty Organisation.

AIRFIELDS

As part of the expansion there has had to be an extensive programme of airfield development. New airfields have had to be built, and many wartime airfields, which were closed after the war, have had to be re-opened and re-conditioned. This has involved not only the re-conditioning of runways and buildings but also the construction of many new runways, as the jet and other aircraft now in service require longer and stronger runways than were necessary during the war.

Superimposed on the Air Force programme have been the requirements of the United States Air Forces in the United Kingdom, and to a lesser extent those of the Royal Canadian Air Force. The airfields and other facilities provided for these forces have had to be replaced by the provision of others for the Royal Air Force, and in addition there is the substantial airfield building programme required in Europe as part of our contribution to the defence of Western Europe (commonly known as "Infrastructure").

Unfortunately, the demand for essential work services for defence, such as airfields, and the priority accorded to the civilian housing programme have resulted inevitably in a lowering of the domestic standards of accommodation, which in turn is likely to have some adverse effect on recruiting.

RESERVES

The main classes of Reserves are the Royal Auxiliary Air Force, which consists of formed units such as the fighter squadrons and which are intended to take their place in the front line on, or shortly after, the outbreak of war; the Royal Air Force Volunteer Reserve, which provides a pool of aircrew and ground tradesmen, who maintain their skill by an annual training commitment and who are therefore available immediately in war to strengthen existing units or to form new units; the officers and men from the last war (Class "G"), who are still liable to recall in an emergency; and the National Servicemen of to-day who pass to the Reserve (Class "H") and who have a reserve liability of three-and-a-half years during which they can be called up for annual training.

In order to improve the operational readiness of the Auxiliary fighter squadrons, they were called up for a three-month period of training during 1951, and a large number of Reservists were called up for fifteen days' refresher training in the control and reporting system. A large number of aircrew Reservists were also called up for three months' intensive flying training, and a number of qualified flying instructors have volunteered to return to the active list for eighteen months to help to train the additional pilots needed for expansion.

The ex-wartime Reservists are a rapidly dwindling asset, and the main bulk of the Reserve in the future will consist of the National Servicemen called up under the National Service Act of 1948. The increase of the period of National Service from eighteen months to two years slowed down the rate of flow to the Reserve, but up to the beginning of 1952 some 35,000 men had passed to the Reserve in the Air Force, and the Reserve of Class "H" will reach its maximum in 1954-55, when the first entrants will complete their three-and-a-half years' Reserve liability and begin to leave the Reserve.

The National Service Reservist, owing to his short period of Regular service, cannot provide the more highly skilled officers and men in the numbers required, nor are there sufficient of these in the ex-Regulars. It is therefore essential to build up the Royal Auxiliary Air Force and the Volunteer Reserve. Probably because of National Service, however, it is becoming increasingly difficult to maintain the numbers required in these forces, and a satisfactory solution to this problem has still to be found.

DEFENCE REQUIREMENTS

There are four main defence requirements to be fulfilled by the three Services, in all of which the Royal Air Force has to play its part. These are the defence of the United Kingdom, the safeguarding of the sea routes on which we are dependent for our supplies, the protection of our interests and those of the Commonwealth overseas, and our contribution to the defence of Western Europe under the Brussels and Atlantic Treaties. All these commitments are to some extent complementary, but they cover such a wide field that there is a definite danger that we may dissipate our resources by attempting too much.

Furthermore, the requirements of the cold war are different from those of a shooting war, but it is for the latter that we must prepare. During the last year or two the aircraft that would have been most useful above all others would have been transport aircraft. There was first of all the Berlin air lift, and since then transport aircraft have been urgently needed on several occasions so that our reinforcing troops could have been moved rapidly to such theatres as Korea, Malaya, Iraq (for Persia), and latterly Egypt. Instead, the meagre resources of Transport Command, supplemented by chartered civil aircraft, could move only a small proportion of the reinforcements required, the bulk having to be moved by sea.

When economies were being imposed on the Services in 1950 Transport Command was severely reduced, and although the run down was halted in 1951 no expansion has been possible, owing to the paramount need to increase our strength of operational aircraft. The real answer is the expansion of our civil air transport resources, so that in emergency they can be used for military purposes, but as the aircraft industry cannot even produce all the additional aircraft required for the Air Force, it seems unlikely that there can be much increase in the production of civil aircraft. A start has been made, however, by the opening during 1952 of a factory at Short and Harlands, Belfast, for the production of additional Comet jet airliners.

Last year, following the decision that the operational resources of British Air Forces of Occupation, Germany, should be placed at the disposal of the Supreme Commander, Allied Powers in Europe, the Command was renamed 2nd Tactical Air Force, the title that was originally used by the British element of the Allied air forces during the invasion of Europe. During the past two years the Command, which has now become primarily, as its name implies, a tactical air force, has been substantially built up, and may undertake still further commitments. When foreign affairs were being debated in the House on February 5, 1952, the Foreign Secretary said that "a considerable measure of blending between the air

forces of the United Kingdom and of Europe may well prove to be a particularly profitable field of action."

Later, in the statement accompanying the Air Estimates for 1952, it was stated that the largest expansion is taking place in the Tactical Air Force, and at the Lisbon Conference at the end of February it was announced that the British contribution to the Allied strength of 4,000 aircraft under the Supreme Commander would amount to some 1,700 aircraft.

The re-equipment of Fighter Command and the 2nd Tactical Air Force with F86E Sabre aircraft (which have been so successful in Korea) will help to bridge the gap until our own new types of fighters, such as the Hawker Hunter and Supermarine Swift are in production, and the re-equipment of Bomber Command with the Canberra, which is now coming into service, and at a later stage with the four-engined jet bomber the Valiant, is going enormously to increase the range and striking power of our bomber force.

Coastal Command is also being greatly strengthened. The Avro Shackleton came into service last year, and several new squadrons will be formed this year equipped with the P2V-5 Neptune aircraft provided by the United States under the Military Aid Programme.

Both the aircraft production and the expansion programmes have been considerably assisted by the Government's decision, when the original £3,400 million programme was announced, to allow orders for aircraft to be placed for three years and for planning to proceed on the same basis. This has meant that expansion has progressed at a more even rate than if the programme for each year had to be considered separately, but would not prevent the programme being slowed down or reduced should there be any lessening in the international tension.

THE FUTURE

During the debate on defence on March 5, 1952, the Prime Minister announced that super-priority was being given to the production of new types of day interceptor fighter aircraft, including the Hawker and Swift fighters. These measures, together with the equipment of some squadrons with Sabre fighters, should result in a considerable increase in the strength of Fighter Command during the coming year.

The position at the time of writing, in the spring of 1952, is that expansion has been in progress for a little over a year. Although some new squadrons have been formed and others re-equipped, the progress made so far, because of the principal limiting factor, aircraft production, has been more in the direction of building up the framework for a much greater expansion of operational strength than in an actual increase in the front-line strength. The foundation having been laid, it should be possible from now on to expand at a more rapid rate, and by the time the present programme has been achieved, which should be about the end of 1954, allowing for the slowing down that has had to take place in the £4,700 million programme of January 1951, the Royal Air Force should be well placed for a further expansion should that unfortunately prove necessary.

W. M. YOOL

CHAPTER XXVI

TRAINING IN THE ROYAL AIR FORCE, 1951

FLYING TRAINING

THE EXPANSION of the Royal Air Force, as part of the increased defence requirements generally agreed by the North Atlantic Treaty Organisation as essential for the maintenance of security, has resulted in a large initial burden being placed on the flying training organisation of the R.A.F. The introduction of flying training for National Servicemen has, at the same time, met with a good reception. By a system of pre-“call-up” assessment at Selection Centres, National Service candidates are informed at the age of 17 of their suitability for aircrew training prior to their period of National Service; candidates thus avoid the disappointment of entering the Royal Air Force only to find at a later date that they are unsuitable for flying duties. Candidates who pass the selection tests can elect to do the required two years’ period of National Service only, or they can extend their service by various periods up to the completion of a regular permanent engagement. This additional flying training, over and above the expanded training of regular long-term entrants has not only meant an expansion in Flying Training Command and the operational training elements of the operational Commands, but has also required the aid of Home Command. As expanded, Flying Training Command now consists of four Groups. No. 54 Group undertakes all Initial Training, including military and academic pre-flight training; No. 21 Group carries out the training of navigators and air signallers; No. 23 Group is charged with basic and applied pilot training; and No. 25 Group with the jet conversion of pilots at Advanced Flying Schools. This expansion programme will produce some 3,000 fully trained aircrew in the coming year. It includes the opening of eleven new flying schools; new instructional aircraft are being delivered to Flying Training Command to train aircrews for the expanding operational Commands of the Royal Air Force.

Several new schools for Regular and National Service pilots and navigators were opened during the year. Home Command’s contribution to this training effort consists of the operation of five Basic Flying Training Schools, at Booker, Ansty, Derby, Sywell, and Desford, and the running of two Navigation Schools at Hamble and Usworth respectively. Pilots receive 60 hours’ flying in 12 weeks on Chipmunks at the Basic Flying Training Schools in Home Command; thereafter they transfer to Advanced Flying Training Schools in Flying Training Command to complete 120 hours’ flying on Oxford aircraft before jet conversion training at the Advanced Flying Schools. Navigators complete approximately 100 hours’ flying in Home Command Units before joining the Advanced Flying Schools in Flying Training Command. Both pilots and navigators trained initially in Home Command are National Service entrants.

For Regular Service pupil pilots Flying Training Command has reopened No. 1 Flying Training School at Moreton-in-the-Marsh (Gloucester), and similar schools at Feltwell (Norfolk), Ternhill (Shropshire), and

Cottesmore (Rutland) are now working to increased capacity. These schools operate Prentice and Harvard aircraft, on which the pupil pilot completes some 60 and 120 hours respectively before being awarded the flying badge on completion of the basic and applied stages of training. Similarly, the output at the pilot training schools in Southern Rhodesia at Heany and Thornhill has been increased. Pupil pilots are flown out to these schools from the United Kingdom and flown back on completion of their training there, prior to jet conversion in Flying Training Command. The Royal Canadian Air Force is affording valuable assistance in training both pilots and navigators. At R.C.A.F. Stations Gimli (Winnipeg), Summerside (Prince Edward Island), Centralia (Ontario), and Claresholm (Alberta) a steady flow of pilots and navigators are trained by R.C.A.F. instructors. Here again, pupils are flown to and from Canada, and the potential pilot or navigator has the experience of an Atlantic air crossing before beginning his training.

Navigation training facilities are also being expanded in Flying Training Command. In addition to existing schools increasing their output, No. 6 Navigation School has been formed at Lichfield (Staffs) and another navigation school is due to open in the summer of 1952 at Bishop's Court (Northern Ireland).

Advanced Flying Schools are increasing their capacity. At these schools, pupils who are to become fighter and jet bomber pilots start their jet training; similarly, pilots who will fly piston-engined aircraft in Bomber, Coastal, and Transport Commands, begin to fly heavier and more advanced types of training aircraft. Additional Advanced Flying Schools are being formed to train pilots for Fighter and Bomber Commands, including several schools where specialised training is given in "all-weather" training. These schools feature a large proportion of night and instrument flying in their syllabi of instruction. Of the existing Advanced Flying Schools, No. 205 has changed from the day-fighter category to "all weather." A further four Advanced Flying Schools are planned to open in the first quarter of 1952 at Oakington (Cambridge), Full Sutton (Yorks), Merryfield (Somerset), and Finningley (Yorks) respectively.

As for new aircraft, the Vickers Varsity crew trainer has now replaced the Wellington at No. 201 A.F.S., Swinderby (Lincs). This Advanced Flying School is charged with the training of pilots who will fly piston-engined aircraft in the operational Commands. The Varsity, a tricycle monoplane powered by two Bristol Hercules engines each of 2,100 h.p., has a performance far in excess of any existing trainer of similar category. It has a maximum speed of 290 m.p.h., cruises at 210 m.p.h., and can climb over 28,000 feet. It can take off on one engine and possesses outstanding handling qualities. A typical crew complement is a flying instructor and pupil pilot, a signals instructor and pupil, and a navigation instructor and two pupils. Varsitys are also to replace Wellingtons at Air Navigation Schools.

Another new trainer which has recently gone into service at the navigation schools is the Vickers Valetta T/3, "Flying Classroom," which can carry ten student navigators. First deliveries of Handley Page Marathon aircraft will reach Air Navigation Schools in mid-1952 as advanced trainers for navigators. Marathons are being modified and equipped with all navigational aids. The Boulton Paul Balliol—applied flying trainer—

will start to replace the Harvard at flying training schools during the summer of 1952.

The Operational Conversion Units (O.C.U.s) under the control of the operational Commands are being expanded to absorb aircrew for further training in the specific operational roles of the particular Command. The greatest expansion is in the Fighter Command O.C.U.s. These O.C.U.s. are charged with training interceptor (day and night) and ground attack pilots for Fighter Command, 2nd Tactical Air Force, and the tactical elements of the Middle and Far East Air Forces. This expansion is due to the expansion of Fighter Command and to the rapid build-up of the 2nd Tactical Air Force, thereby making available to the Supreme Commander Allied Powers Europe a strong British contribution to the integrated Air Force for the defence of Western Europe. The Operational Conversion Units, by types, being operated in the R.A.F. are as follows:

- (a) Combined Day Fighter and Fighter Reconnaissance O.C.U.s. (Fighter Command)
Meteor T.7, F.4, F.8, F.R.9 aircraft. Vampire 5B.
- (b) All-weather and Night Fighter O.C.U.s. (Fighter Command)
Meteor T.7, Mosquito N.F.36, Brigand, Buckmaster aircraft.
(Re-equipping with Meteor N.F.11 and Vampire N.F.10)
- (c) Air Observation Post O.C.U.s. (Fighter Command)
Auster 5, 6, and 7 aircraft.
- (d) Heavy Bomber O.C.U.s. (Bomber Command)
Lincoln and Washington aircraft.
- (e) Medium Bomber and Target Marker O.C.U.s. (Bomber Command)
Canberra B.2 Mosquito aircraft.
- (f) Short- and Long-Range Photographic Reconnaissance O.C.U.s. (Bomber Command)
Meteor T.7 and P.R. 10, Mosquito P.R.35.
(Re-equipping with Canberra P.R.3.)
- (g) Long-range Maritime Reconnaissance O.C.U.s. (Coastal Command)
Sunderland, Shackleton, and Neptune aircraft.
- (h) Long-range and Medium-Range Transport O.C.U.s. (Transport Command)
Hastings and Valetta aircraft.

On completion of O.C.U. training, aircrew take their place in front line squadrons in the United Kingdom or overseas.

CENTRAL INSTRUCTORS SCHOOLS

With an expansion of training it is essential that highly skilled and competent instructors are available in sufficient numbers to provide instruction of the highest order and to ensure high qualitative performance in the trained aircrew. Potential instructors are therefore selected from experienced squadron personnel and given instructor courses at the Central Flying School, Navigation School, or Central Gunnery School, where they are schooled in the art of instruction. On the completion of their courses they join the various training units to pass on their knowledge and to ensure that a high and uniform standard of performance is maintained at all stages of training. The output of all instructor courses has therefore had to be

increased to cope with the volume of training now being undertaken. Fortunately, this task has been eased to a certain extent by the re-entry into the R.A.F. of wartime instructors already trained in instruction. After short refresher courses they have been able to return to instructional duties, thereby releasing younger officers to front-line duties. Although training has been expanded and the time taken to train aircrew has been reduced, it is only by maintaining the standard of instruction that efficient front-line squadrons are produced. The Central Instructor Schools continue to play a vital part in the maintenance of standards in their control of instructor training.

MAIN OPERATIONAL ROLES OF THE ROYAL AIR FORCE

HOME DEFENCE

Fighter Command is charged with the defence of the United Kingdom against air-attack. Anti-Aircraft Command, which is under the operational control of Fighter Command, assists in this task. The Royal Observer Corps, also under the control of Fighter Command, consists of a defensive visual warning organisation which is an essential supplement to radar detection of enemy approach. An intricate communication network ensures that all three organisations can co-ordinate their efforts to the more efficient destruction of attacking enemy forces. A secondary responsibility of Fighter Command is the requirement to train squadrons in tactical support of the Army and in the protection of coastal shipping. Fighter Command aircraft consist of Meteor F.8, Vampire 5B, Meteor Night-Fighter/All-Weather N.F.11. The Vampire Night Fighter Mark 10 will shortly be coming into service, and the swept-back wing Supermarine Swift and Hawker Hunter aircraft are in production with the highest priority as replacements for the Meteor and Vampire in the front line. The Royal Auxiliary Air Force squadrons equipped with Meteor F.8 and Vampire 5B aircraft are part of Fighter Command's front line force. During the summer months some twenty fighter squadrons were called up for three months intensive training. Unlike the Regular pilots and groundcrews of Fighter Command who undergo continuous and full-time training to maintain maximum efficiency, the Auxiliaries give up their leisure time at week-ends to attain the same object. Harvards and Meteor T.7's are used for training by all Auxiliary squadrons. Training is normally carried out at a town headquarters during the week, supplemented by week-end flying and ground instruction programmes at an airfield, and a fifteen-day annual training period at an armament training camp. This year, of course, the fifteen-day annual training period was replaced by the three-months call-up. The Royal Auxiliary Air Force is not composed entirely of fighter squadrons. There are 26 Auxiliary Fighter Control Units, 1 Radar Reporting unit, 12 Light Anti-Aircraft squadrons of the Royal Auxiliary Air Force Regiment, 5 Air Observation Post squadrons equipped with Auster aircraft and flown by Territorial Army pilots for artillery spotting duties, and 1 transport squadron equipped with Valetta aircraft. The latter squadron is manned almost entirely by members of the civilian firm of Airwork Limited; normal charter services provide day-to-day training for the squadron personnel, and the specialised

military training required to supplement this is obtained on the Valetta aircraft under the direction of Transport Command.

STRATEGIC BOMBING

Bomber Command Headquarters located at High Wycombe (Bucks) controls No. 1 Group, Bawtry (Yorks), and No. 3 Group, Mildenhall (Suffolk). The main role of the Command is to direct and control strategic bombing operations; its secondary roles involve support of the other Services. The present bomber aircraft with which the Command is equipped—namely the Lincoln and the Washington (B.29)—cannot be regarded as long-range bombing aircraft meeting modern requirements. To fill this need the Vickers Valiant four-jet bomber has been accorded a "super priority" of production equal to that of the jet fighters now in production. Fitted with four jet "Avon" Rolls Royce engines buried in the roots of swept-back wings, the Valiant has a bomb bay of large dimensions. While no technical details are available, it will undoubtedly have a superior performance in range, speed, altitude, and load-carrying capacity, which might well give the United Kingdom the lead in the jet bomber field. In the interim period before re-equipment with the Valiant, reliance for strategic bombing against any aggressor has been placed, in the main, on the United States Air Force. The need for an efficient and adequate bomber force, not only to strike at the enemy and to throw him on the defensive but to provide for our own security, accounts for the high standard maintained in Bomber Command at the present time. Navigational ability and bombing accuracy together with a high degree of mobility ensure that present forces can be used both by night and by day to the limit of radius of action for maximum effectiveness. The force is therefore kept in first-class fettle and well trained in those principles which will govern its deployment on the Valiant aircraft and enable crews to play a vital part in any future strategic offensive. The Canberra B.2 has come into service to replace the Mosquito in the light bomber role, and will, it is assumed, also replace the Mosquito in the target-marking role. Similarly, the Photographic Reconnaissance duties of Bomber Command will involve the replacement of the Mosquito P.R.34 with the Canberra P.R.3, which, with the Meteor P.R.10, will provide all high-altitude photographic reconnaissance. The sole Lancaster squadron now in Bomber Command is engaged on air photography for survey purposes in Africa.

DEFENCE OF SEA COMMUNICATIONS

Coastal Command Headquarters is at Northwood, Middlesex; it controls No. 18 Group (Dunfermline), No. 19 Group (Plymouth), and R.A.F. Gibraltar. Coastal Command forces play an integral part in the organisation of the Supreme Allied Commander Atlantic in that the A.O.C.in-C. of Costal Command, the A.O.C. of 19 Group, and the A.O.C. of No. 18 Group are also Air Commander in Chief Eastern Atlantic, Air Commander North East Atlantic, and Air Commander North Sea respectively. Together with their Royal Navy counterparts, these officers and the forces under their control form a strong British contribution to the forces at the disposal of Admiral L. D. McCormick, U.S.N., the Supreme Allied Commander Atlantic Command for Atlantic defence.

Coastal Command's role is to ensure the safety, in conjunction with the responsible Navies, of sea communications. This involves finding and shadowing enemy surface vessels and locating and destroying enemy submarines by day and by night with and without the aid of surface vessels. The anti-submarine, escort, and reconnaissance duties of the Command are carried out by Lancaster G.R.3, Sunderland 5, Shackleton 1, and Neptune P.2.V.5 aircraft. The Shackleton and the Neptune are gradually replacing the Lancaster and are in complementary use. The Avro Shackleton, one of the first land aircraft to be designed and built for the maritime role, is proving a very reliable and sound aircraft; fitted with four Rolls Royce "Griffon" engines, it has a large bomb bay which readily accommodates either an airborne lifeboat or special anti-submarine weapons. Armament consists of four 20-mm. guns. It carries a crew of ten and contains a galley for the preparation of meals on long patrols. In the event of two engines being put out of action the Shackleton can return to base on the remaining two. The Shackleton together with the Neptune, which has been allotted to Coastal Command under the American Military Aid Programme, will form the backbone of Coastal Command forces. A helicopter flight of Bristol Sycamores has been formed in the Command to study the possible uses of rotating-wing aircraft for anti-submarine and other reconnaissance duties. It is also proposed that they shall be used in air/sea rescue work. The main aim and object of training in the Command is that shore-based aircraft and ships of the Navies should work as one team in finding and destroying submarines. The Joint Anti-Submarine School, where the Navy and Air Force study the anti-submarine problem together and learn to work as a team, is doing much to achieve this aim.

TRANSPORT ROLE

Transport Command Headquarters is at Upavon (Wilts). The Command is responsible for the carriage of personnel and equipment at home and overseas and between home and overseas establishments for the R.A.F. and other Services. It is also responsible for providing aircraft for airborne assault and air supply operations.

In addition to carrying men and material, the Command is charged with the delivery of aircraft to and from overseas Commands. The Handley Page Hastings and the Vickers Valetta carry out the long- and medium-range transport, airborne assault, and supply roles.

Crews are trained in conjunction with the Army in the mounting and execution of airborne assault and supply operations. Pilots engaged on ferry duties frequently have to fly short-range jet aircraft to overseas Commands; the survey flights prior to these operations are frequently undertaken by Valetta aircraft when, in addition to surveying routes and assessing suitability of airfields, the crew have to make administrative arrangements and establish operational procedures to ensure the subsequent smooth passage of a large number of jet aircraft over the chosen route. Ambulance services, for the rapid removal of battle casualties or the injured to base hospitals, are also part of Transport Command's daily routine, and the rapid recovery of many patients is due to the earlier skilled attention that is brought to bear as a result of air evacuation of the wounded. Similarly, the rapid provision of urgent stores and equipment to front-line

units, such as the delivery of winter clothing to British troops in Korea, is undertaken by the Command, as is also the delivery of mail. The thousand and one duties that require to be carried out by air transport, not only to supply the man in the front line with the necessities of battle but to provide for his comfort and to ensure that his lot is ameliorated as far as is possible, are part of those services which Transport Command maintains in conjunction with the Merchant Air Service, which has now taken over air trooping on behalf of the Command. Transport Command plays an essential part in the activities of all home-based and overseas Commands. Its Commander-in-Chief, as Inspector of Transport Services, is responsible for the inspection of air transport trunk routes and advises Cs.-in-C. of overseas Commands on the training and operation of overseas-based transport forces.

TACTICAL ROLE

Tactical Air Forces are composite formations including light bomber, fighter, fighter ground attack, and reconnaissance squadrons. There are three mainly tactical formations in the Royal Air Force: 2nd Tactical Air Force, Middle East Air Forces, and Far East Air Forces. The 2nd T.A.F. Headquarters is at Bad Eilsen, Germany. The 2nd T.A.F., Royal Air Force, is being merged into the 2nd Allied Tactical Air Force which is to guard the Western European approaches and to give support to associated ground units. The intention of the C.-in-C. Allied Air Forces Central Europe is to establish two Allied Tactical Air Forces. In the Northern Sector, 2nd Tactical Air Force, Royal Air Force, provides the basis for the 2nd Allied T.A.F. in conjunction with the Netherlands Tactical Air Command and No. 2 Belgian Wing, including Nos. 1, 2, and 3 Squadrons. The Commander-in-Chief 2nd T.A.F., Royal Air Force, Air Marshal Sir Robert Foster, will also command the 2nd Allied T.A.F. In the Central Sector the nucleus of the 4th Allied T.A.F. will be the United States Twelfth Air Force, with the French First Air Division including Nos. 1, 2, and 3 Squadrons, an Air Division of the Royal Canadian Air Force and several other squadrons under the command of Major-General Dean C. Strother, U.S.A.F. Both Commanders will integrate their radar control and reporting systems with that of the Central European Command. The 2nd Allied T.A.F. is equipped with Meteors, Vampires, Thunderjets, Mosquitos, and Spitfires. Its R.A.F. squadrons are shortly to be re-equipped with Venom aircraft. The 4th Allied T.A.F. includes Thunderjets, Vampires, B.26 Invaders, and C.119 Packets. When Royal Canadian Air Force squadrons are established on the Continent, the 4th Allied T.A.F. will be reinforced by F.86E Sabres.

The Headquarters of the Middle East Air Forces is at Ismailia, Egypt. The Command covers a large geographical area, and to assist in the control of the area has the following subordinate formations—No. 205 Group, Fayid; No. 206 Group, Abyad; Air Headquarters, Malta; Headquarters British Forces, Aden; and Air Headquarters, Iraq. Aircraft on the Command strength are Vampire 5, Spitfire F.R.18, Brigand B.1, Mosquito N.F.36 and P.R.34, Lancaster G.R.3, Auster 6, and Valetta C.1. The transport element of the Command has been reinforced during the year by Valettas and Hastings of Transport Command. Similarly, Bomber Command squadrons continue to make monthly trips from the United

Kingdom to Shallufa (Canal Zone) for intensive armament and navigation training.

Headquarters Far East Air Forces is at Changi (Singapore), and its subordinate formations comprise Air Headquarters, Ceylon, Air Headquarters, Malaya, and Air Headquarters, Hong Kong. The Command had under its control during 1951 Vampire 5, Brigand B.1, Mosquito P.R.34, Spitfire F.18, F.R.18, F.24, Dakota C.4, Valetta C.1, Sunderland G.R.5, Lincoln, Hornet, and Auster 6 aircraft. In addition the Command operates helicopters (Westland, Sikorsky, Dragonfly, Mark 2 Rotorcraft) for casualty evacuation from jungle clearings. Currently engaged in war against Communist bandits in co-operation with the Army and Police, the Command is keen to employ more helicopters to help security patrols in their tasks. Brigands, Hornets, Spitfires, Vampires, Lincolns, and Sunderlands have been used in air strikes against bandit concentrations. Co-operating with the R.A.F. are Royal Australian Air Force Lincolns, and Royal New Zealand and Royal Australian Air Force Dakota squadrons. Supply dropping to our ground forces and the dropping of propaganda and surrender leaflets to the bandits have played a great part in sustaining the offensive. Sunderland flying-boats continued anti-submarine and anti-shipping patrols around the coast of Korea in support of the United Nations effort there.

OPERATIONAL TRAINING

Throughout 1951 all units were exercised in their primary roles and in support of the other Services. The co-operation in exercises of aircraft of Bomber Command, of Fighter Command, and of Allied Air Forces Central Europe increased in tempo during the year and became established as routine exercises. Exercise "Barrage" controlled by A.A.F.C.E. consists of an air defence exercise held in the A.A.F.C.E. area twice monthly, in which all A.A.F.C.E. aircraft and also aircraft of Fighter Command and Flying Training Command take part. Exercise "Bait" and Exercise "Bullseye" are run in conjunction, once monthly, by Fighter and Bomber Commands respectively. Fighter Command's exercise is primarily an air defence exercise, while Bomber Command's exercise consists of bomber attacks on Continental targets by night and by day in bad weather. Each Command thus obtains practice in its role, and a more realistic situation is simulated with attacks by interceptor aircraft on the bomber force. The methods of control and reporting and the efficiency of the communication and radar reporting systems are therefore under constant scrutiny by virtue of these routine exercises.

Demonstrations of fire power were given at the School of Land/Air Warfare, and squadrons of the 2nd Tactical Air Force were detached throughout the year for co-operation with various Army Commands during exercises, for demonstrations at the School of Infantry, and with H.Q. Combined Operations. This co-operation generally involved rocket and cannon attacks, fighter support, reconnaissance, and the functioning of an Air Contact Team to illustrate the method of calling for air tactical support. Transport Command provided demonstrations of transport support at the School of Land/Air Warfare consisting of parachute jumping, supply dropping, and the dropping of heavy equipment by parachute.

Demonstrations of Transport support were also carried out for the Territorial Army and the Royal Navy.

Lincoln aircraft of the Central Navigation and Control School have completed Arctic navigation training flights to Canada and the polar regions in practising current high-latitude navigation techniques, and have carried out exercises over Greenland operating from Keflavik, Iceland.

An English Electric Canberra B.2 piloted by Squadron-Leader A. E. Callard, D.F.C., made the first direct Atlantic crossing by a jet-propelled aircraft, without refuelling, from Aldergrove (Northern Ireland) to Gander (Newfoundland), a distance of 2,100 miles, in an elapsed time of 4 hours 37 minutes. The Canberra was being delivered by its R.A.F. crew to the U.S.A.F. for evaluation in the night-intruder role. Later reports state that plans are being made for the production of the Canberra at the Glenn L. Martin plant in Maryland (U.S.A.).

The Royal Air Force and the Royal Australian Air Force during December, 1951, made their 2,000th airstrike against the terrorists in Malaya. The first anti-bandit airstrike took place six days after the declaration of Malaya's present state of emergency in June, 1948, when three Spitfires bombed a terrorist camp. Bandit dead were found in the wrecked huts by a military follow-up party.

Since then the Far East Air Force has been almost completely re-equipped with jet fighters and Hornet twin-engined piston fighters. The 2,000 airstrikes have involved well over 10,000 individual aircraft sorties and have included targets in almost all Malaya's States. Although air warfare against the terrorists in Malaya is unrewarding for the aircrew taking part—the dense jungle absorbs and masks bombing, rocket, and strafing attacks like the sea—Army and police ground patrols have high praise for the accuracy with which attacks are carried out. Helicopters of the Far East Air Force Casualty Evacuation Flight in Malaya have now airlifted nearly 100 Army, police, and civilian casualties from the jungles in the war against the terrorists.

In some cases casualty air evacuation has unquestionably saved the life of the patient, and in all cases it has safeguarded the general health of men who would otherwise have faced long and difficult jungle treks to the nearest point at which surface transport could have taken them to hospital. Security Force patrols (as the Army and Police forces are called in Malaya) sometimes operate far out into the remote jungle, supplied all the time by parachute drops by R.A.F. aircraft. Casualties in action, or from accident or sickness, are a big liability to the patrols in these isolated areas. Under present arrangements a patrol with a casualty sends a radio message for an ambulance helicopter and moves to the nearest natural or artificial clearing in which it can land. In some cases the men of the patrol cut a clearing of their own, sometimes using explosives and petrol-driven portable saws dropped to them from the air. When the clearing is ready the helicopter moves in, often having flown for hundreds of miles across jungle, swamp, and mountain. The casualty is placed aboard, in a special stretcher, and in a few hours—sometimes only a few minutes—is flown to hospital. Troops and police of all ranks and nationalities have been airlifted by this service. Even captured bandits—in one case a woman—have occasionally been flown out of the jungle by this method for treatment or interrogation. In just over a year's work the helicopters have suffered only one casualty: an

aircraft wrecked in a difficult clearing following engine failure after take-off. Neither the pilot nor the patient was hurt

“Odd jobs” undertaken by the helicopters when free from operational duty have included the spraying with insecticide of land on Singapore Island, special taxi missions for V.I.Ps. in connection with the Emergency, and specialised search and photographic duties in cases where an aircraft able to move slowly, or to hover, has been required.

Royal Air Force Sunderland flying-boats operating from a base at Iwakuni in Japan have now flown about a thousand missions in support of the United Nations’ effort in the Korean war. The length of each mission is between 10 and 12 hours, and their tasks range from the rescue of “ditched” aircrews, searches for enemy minefields, and patrol of United Nations convoy routes to routine weather reconnaissance and V.I.P. ferrying flights. The Sunderland squadrons, which form the Far East Flying-Boat Wing based on Singapore, take it in turn to provide aircraft for duty in the Korean operations. They share the base at Iwakuni with American flying-boat units, missions being flown turn-and-about by British and Americans.

In June, 1949, on the outbreak of the Korean War, the R.A.F. Sunderlands were detailed for duty at Iwakuni, and the first operational patrol (a search for enemy shipping) was flown over the Yellow Sea three weeks later. Day-to-day duties undertaken by the Sunderlands and shared with U.S. Mariner flying-boats include weather reconnaissance flights far out into the Yellow Sea and over the Taushima Straits to obtain data by which bomber, fighter, and transport flights by other United Nations aircraft can be regulated. These flights last anything up to 15 hours, as do patrols off the east coast of Korea to interdict enemy shipping and spot minefields. Apart from the work of the Sunderlands, the British air contribution to the United Nations’ effort in Korea includes a regular service of transport aircraft to ferry urgent operational supplies, and a service of Hastings ambulance aircraft to repatriate battle casualties. The ambulance service operates for the benefit of patients from all the United Nations on its route, and it has transported well over 1,000 sick and wounded from a dozen European and Asian countries.

No. 82 Squadron, the only Lancaster squadron remaining in Bomber Command, has now entered its sixth year of air photography for survey in Africa. This photographic task of the Royal Air Force is to assist the Directorate of Colonial Survey to produce topographical maps, mainly on a scale of one inch to the mile, which are needed for various development schemes. These include the strategic railway link between East and Central Africa, irrigation projects in Basutoland, hydro-electric schemes in Rhodesia and West Africa, and the general agricultural and mineral development of African territories. A flight of the squadron first started work in West Africa towards the end of 1946, and the complete squadron became fully operational in East Africa the following spring. Since that time it has covered over 970,000 square miles in many different parts of Africa. During the period April–December, 1951, the squadron photographed nearly 170,000 square miles in Northern and Southern Rhodesia, Nyasaland, and Tanganyika. Aircraft were based at Tabora, Livingstone, and Dar es Salaam. They flew 631 photographic sorties, and averaged approximately 90 hours’ flying per aircraft per month. Previously the

squadron was in West Africa, where aircraft flew sorties totalling 3,358 hours, giving an average of just over 64 hours per aircraft per month.

As a result of an 8,500 mile R.A.F. survey flight from the Suez Canal Zone to Pretoria and back which has recently been made in a Valetta transport aircraft, jet aircraft may one day stage through airfields in the remotest parts of the African continent. The route crossed Egypt, the Sudan, Kenya and Northern and Southern Rhodesia. Lindi and Dar es Salaam (Tanganyika), Mombasa (Kenya), Mogadishu (Italian Somaliland), Hargeisha (British Somaliland), Aden, and Port Sudan were among the places visited. The longest two-way ferrying flight of jet aircraft ever undertaken by the Royal Air Force was made between England and Singapore starting in December, 1951. The distance covered was 17,700 miles.

The aircraft ferried to Singapore were de Havilland Vampire 9s for the Far East Air Force squadrons engaged on anti-bandit operations in Malaya. The same pilots, who belonged to the Transport Command Overseas Ferry Unit, will fly back to England the Vampire 5s now being used by F.E.A.F.

The Vampire 9 is similar to the Mark 5 ground attack aircraft but is fitted with the Godfrey cold air unit, developed to increase the pilot's comfort and efficiency when flying in tropical climates. The refrigeration unit, which is driven by the Vampire's jet engine, supplies cooled air to the cockpit and is designed to reduce an average tropical cockpit temperature of 120 degrees Fahrenheit to a figure in the neighbourhood of 95 degrees.

A three-year programme of investigation into monsoons and tropical weather conditions has just been completed by a small Royal Air Force unit, No. 1301 Meteorological Flight, which, from its base in Negombo, Ceylon, has flown over nearly half-a-million square miles of the Indian Ocean. From its formation early in 1949 it was part of the Flight's policy that no alterations from course would be made because of adverse weather along the route. This decision has resulted in a gain of much valuable experience in thunder-cloud flying. Such clouds are not at all uncommon in the area covered and during the transitional period between the north-east and south-west monsoon, in October and November, they have been encountered with tops estimated to be over 40,000 feet. They provided the worst flying conditions experienced by the Flight. Aircraft used were twin-engined Brigands, which are basically similar to the strike version of this aircraft at present in use against bandits in Malaya. Certain modifications had necessarily to be carried out. The guns were removed and de-icing fluid tanks for propellers and airframes were fitted in place of ammunition boxes. Special instruments were also installed. The main object of the flight was to examine the behaviour of what is known as the Inter-Tropical Front, the area of demarkation between the air masses generally associated with the northern and southern hemispheres and often viewed by aircrews with anxiety. A great amount of valuable information on air masses and actual weather was accumulated by the Flight.

Since the 16th Independent Parachute Brigade Group moved from Cyprus to the Suez Canal Zone a fully equipped Airborne Training Centre has been created at a Royal Air Force station on the shores of the Great Bitter Lake to undertake the continuation training of the Brigade's troops.

A comprehensive range of ground training apparatus has been installed—

swings, chutes, "mock-up" aircraft interiors, and other devices—on which the paratroops can improve their techniques and increase their efficiency. Four-engined Royal Air Force Hastings aircraft equipped for paratrooping and supply dropping are available for airborne training, and similarly equipped Valetta aircraft of the Middle East Air Force transport wing can be used for large-scale exercises. Training is conducted under the direction of Royal Air Force officers and N.C.O.s. who have been detached from No. 1. Parachute Training School at Abingdon, Berks, and are working in the closest co-operation with the Brigade officers. Recently, before a Service audience of several thousands, the Brigade's Heavy Drop School staged a demonstration exercise during which jeeps and a 75 mm. pack howitzer specially constructed for airborne operations were dropped for the first time in the Canal Zone.

Eritrea, Mussolini's former colony in north-east Africa, is now virtually free of the widespread banditry that harassed its administration for four years. The overpowering by armed villagers in January of Tesfai Merit, the notorious gang leader, ushered in a new era of calm to that turbulent country and marked the end of the Shifta as a co-ordinated terrorist force.

The pillaging of outlying villages, the murder of Eritreans, the plundering of cattle, and the theft of arms at one time so terrified the populace that few village chiefs could be induced to inform on the roving bandit gangs, but vigorous measures were introduced by the British Chief Administrator and these have resulted in stamping out the Shifta menace some months before Eritrea becomes self-governing by United Nations' decree. Among measures calculated to rid the country of lawlessness was the calling in of the Royal Air Force to work with infantry and Eritrean Police Field Force in hunting out bandits.

First twin-engined Brigand fighter-bombers, then Spitfires, joined in anti-Shifta work, but as the tempo of terrorist activities began to mount in mid-1950 a flight of lightweight Auster Aircraft from Tripoli was introduced to locate armed bands of terrorists, keeping mobile ground forces in touch with base, dropping supplies to them, flying out wounded, and ferrying police and Army Chiefs about the country.

To-day a Royal Air Force Air Observation Post flight, which in two years has helped inflict reverses on the Shifta, is still in Eritrea supporting police in subduing small-scale outbreaks that even now occasionally occur in the territory.

The foregoing examples represent a cross-section of the varied tasks that the Royal Air Force is called on to carry out in its operational training across the world. The strengthening of the forces available for Western European defence has, however, proceeded throughout the year, as will be seen from the following exercises which exercised Royal Air Force formations in their roles, individually and in conjunction with other N.A.T.O. air and other forces.

EXERCISES

The following major exercises were held during 1951 :

EXERCISE—"STRAITS ONE"

February 26—March 5

Sunderland and Lancaster aircraft of Coastal Command, together with aircraft of the United States Navy, were exercised in an anti-submarine

role in conjunction with surface forces in the Gibraltar area. In Phases 1 and 3 of the exercise the aircraft role was entirely anti-submarine and protection of shipping lanes. Phase 2 consisted of close-escort patrols to a heavy task force in addition to protection of shipping lanes.

EXERCISE—"MARCH FLIGHT"

March 11-14

On return of the Home Fleet, Lancasters and Sunderlands of Coastal Command took part in an exercise in the Bay of Biscay and the South-west approaches. In Phase 1 of the exercise aircraft were employed in the anti-submarine role against submarines in transit to patrol stations, while other aircraft shadowed the Fleet. In Phase 2 aircraft provided anti-submarine escort to a task force, and other aircraft shadowed the task force and made night and day attacks.

EXERCISE—"EGRESS"

April 25-29

The purpose of this exercise was to test the protection of coastal convoys by shore-based fighters, both within and outside shore radar cover. A convoy sailed from Selsey Bill to the Wash and was attacked on passage by naval aircraft and aircraft of the United States Air Force and Flying Training Command; Fighter Command aircraft played a defensive role.

EXERCISE—"OMBRELLE"

May 23-26

Five hundred aircraft from six countries took part in this exercise under General Lauris Norstad, C.-in-C. Allied Air Forces Central Europe. The exercise was designed to indicate the efficiency and development of the air forces to defend the Central European area and to test the efficiency of the developed air defence communication network. The exercise was the logical successor to Exercise "Cupola" held during 1950. Attacking forces consisted of Lincoln and Washington aircraft of Bomber Command, Wellington aircraft of Flying Training Command, B.50s of the United States Air Force in Europe escorted by Thunderjets, and Vampires of the 2nd T.A.F. in Germany. Attacks were directed against a variety of targets such as ports, centres of communications, and military objectives in France, Belgium, and Holland. Defensive forces were disposed as follows:

Beauvechain and Chievres (Belgium)—Mosquito Night Fighters and Meteor 4s of the Belgian Air Force; Florennes (Belgium)—U.S.A.F. Thunderjets (F-84E); Luxeil (France)—U.S.A.F. Thunderjets (F-84E). In Luxembourg there were French Vampire 5s, and in Holland 2nd T.A.F. Vampire 5s operated from Soesterburg and Volkel, while Danish Meteors were based at Gilze Rijen. Dakota transports of the Belgian Air Force were based at Melsbroeck, and C-82 packets of the U.S.A.F. at Rhein/Main. The exercise was controlled from an integrated control centre eighty miles north-west of Paris manned by a staff of Allied personnel. Largest of the post-war exercises, "Ombrelle" was a prelude to Exercise "Cirrus," which took place in September.

EXERCISE—"RED DAGGER"

May 26-27

This amphibious warfare exercise took place in the Lulworth Cove area. Fighter Command provided control staff and naval aircraft represented enemy forces during the landings.

EXERCISE—"SEAGULL"

May 28-30

Held in the waters round Scotland, the main object of this exercise was to exercise Lancaster and Sunderland aircraft of Coastal Command in the trade protection role in co-operation with the Home Fleet. During the passage of the convoys round the coast of Scotland attacks were made by submarine, surface mine layers, and aircraft. The convoys were defended by surface forces and by anti-submarine and naval aviation fighter aircraft.

EXERCISE—"PROGRESS"

June 1-8

More than thirty warships of five navies, those of Britain, France, Netherlands, Norway, and Denmark took part in this joint Naval/Air Exercise in the English Channel. Designed to improve inter-fleet communications at sea, the exercise featured the escort of a convoy through attacking submarines, aircraft, and surface ships. French Air Force and Royal Air Force fighters together with the aircraft of the carrier "Indomitable" provided the defensive force. French Bloch 175 aircraft provided the attacking force.

EXERCISE—"VELOX"

June 25-27

In this exercise a large number of Allied minesweepers were due to arrive at Ijmuiden and Scheveningen (Holland) on June 27. On passage they were formed into convoys and subjected to attack by submarines and surface raiders. Coastal Command Lancasters were employed in the pro-convoy role in restricted waters.

EXERCISE—"SILVER STRAND"

June 28-July 1

This was the largest amphibious warfare exercise mounted since the war and took place in the Clyde area. Aircraft from Fighter Command and ground attack aircraft from 2nd T.A.F. took part.

EXERCISE—"SPICA"

August 16-27

This was the first major air defence exercise held by the Royal Norwegian Air Force and sponsored by the C.-in-C. Allied Air Forces Northern Europe. The attacking forces comprised United States Air Force B.50 aircraft based in the United Kingdom, and Vampire aircraft of the 2nd T.A.F. based in Germany.

EXERCISE—"COUNTER THRUST"

September 14-25

Held in Germany, the objects of this exercise were: (i) to exercise an Army Corps in mobile operations on wide fronts, against superior land and air forces, and (ii) to practise the technique of army/air co-operation, and in particular the correct use of reconnaissance. The British Army of the Rhine and the 2nd T.A.F. operated alongside or in opposition to Belgian, Dutch, Norwegian, Danish, and American forces. The two opposing "countries" were Blueland and Redland lying to the south and north

respectively of the frontier represented by the Oldenburg-Bremen-Hamburg railway line. Redland's fighter/ground attack force was three squadrons of R.A.F. Vampire 5s and two Meteor 4 squadrons of the Royal Netherlands Air Force at Wunstorf; three R.A.F. Vampire 5 Squadrons and one squadron of Danish Meteor 4s at Celle; two R.A.F. Vampire 5 squadrons, one of Norwegian Vampires, one of Belgian Spitfire 14s, and one of U.S.A.F. F-84Es based at Fassberg. For reconnaissance there were one squadron of Meteor 9s and one squadron of Meteor 10s operating from Buckeburg. Blueland's fighter ground attack wing of three R.A.F. Vampire 5 squadrons was stationed at Gutersloh. In order to practise the procedure for requesting and controlling strategical bomber support in tactical operations, Bomber Command established a liaison team at the H.Qs. of Redland's tactical group.

EXERCISE—"CIRRUS"

September 28-30

Over 1,000 aircraft from the British, United States, French, Norwegian, Dutch, Danish, and Italian Air Forces took part in this exercise. Principal object of the exercise was to employ, as realistically as possible, the system of command and control of all air and anti-aircraft forces in Western Europe, with special arrangements for mutual support. The integrated control and reporting system was tested thoroughly, particularly in the exchange of air information and the hand-over of fighters between the defending forces. The interlocking efforts of the national air defence forces in their roles and the tactical air forces in both their offensive and defensive support missions were co-ordinated with the efforts of anti-artillery units.

General Norstad, Commander-in-Chief Allied Air Forces Central Europe, was in control of the exercise in which the Western and Eastern sectors and the Central European air defence network were integrated with the fighter defence organisation of the United Kingdom.

EXERCISE—"PINNACLE"

September 28—October 9

Exercise "Pinnacle" ran concurrently with Exercise "Cirrus" and the French Army exercises in Germany ("Jupiter"). As "Cirrus" came to an end on the Continent, "Pinnacle" carried on in Britain; in fact, for the first phases of "Pinnacle" the two exercises were integrated. The object of "Pinnacle" was to exercise the air defence of the United Kingdom against raids by day and by night and to give practice to the control and reporting system. All air defences were deployed including Fighter Command, Anti-Aircraft Command, Royal Observer Corps, squadrons of the Royal Auxiliary Air Force and Royal Auxiliary Air Force Fighter Control Units. The problem of control of civil air traffic under wartime conditions was studied during the exercise. "Pinnacle" was designed to test the recommendations made after assessing the results of "Emperor," held in 1950, and "Foil," which took place in 1949. Attacking forces included Washington and Lincoln aircraft of Bomber Command, Wellingtons of Flying Training Command, F.84s of the 12th Air Force U.S.A.F. based on the Continent, B.45s and F.84s of the 7th Air Division

U.S.A.F., Vampires of the 2nd Tactical Air Force, B.29s and B.50s of the 7th Air Division U.S.A.F., Belgian Meteors, and French Vampires. Defensive forces consisted of R.A.F., R.C.A.F. and R.Aux.A.F. fighter squadrons, one U.S.A.F. fighter group equipped with F.86s, and Royal Naval night-fighter squadrons equipped with Hornets. For the first time jet night-fighters—Meteor N.F.11s and Vampire N.F.10s—were used in a major exercise.

EXERCISE—"SURPRISE PACKET"

October 12-16

The Army aim, in these manœuvres held on Salisbury Plain, was to exercise 1st Corps in mobile operations, with particular emphasis on speed in decision and manœuvre and the development of offensive opportunism. The Air Force aims were: (i) to exercise the air force in operations in support of the Army, including tactical and photographic reconnaissance, and (ii) to provide sufficient air effort against the main army force to train troops and H.Qs. staffs in requesting air support. Vampire 5s and Meteor F.R.9s of the 2nd Tactical Air Force provided the offensive air forces engaged. Hastings aircraft of Transport Command carried out supply dropping.

EXERCISE—"ASSESS"

October 10-22

This was the largest maritime/air exercise held in home waters during 1951, and Coastal Command was fully engaged over an area of more than 400,000 square miles of the North Atlantic, North Sea, and English Channel in conjunction with the Navy. Shackletons, Lancasters, and Sunderlands were exercised in the defence of trade against submarine, surface, and air attacks. Aircraft of Fighter Command together with Sea Furies, Fireflies, and Firebrands of Naval Aviation provided attacking and defensive forces, and some forty ships of the Home Fleet were engaged.

EXERCISES PLANNED FOR 1952

The principal exercises planned for 1952 in which aircraft will take part are as follows:

- (i) Army/Air exercise for Middle East Land and Air Forces.
- (ii) Air defence exercise (United Kingdom.)
- (iii) Air defence exercise conducted by Anti-Aircraft Command, with co-operating aircraft by day and by night exercising various A.A. formations.
- (iv) Brigade Group scale attacks to test arrangements for command and control.
- (v) Annual B.A.O.R./2nd Tactical Air Force manœuvres.
- (vi) Large-scale N.A.T.O. convoy movement exercise.
- (vii) Large-scale N.A.T.O. maritime/air exercise.
- (viii) Large-scale N.A.T.O. manœuvres involving maximum air support.
- (ix) Major air defences exercises in the United Kingdom.
- (x) Exercises with the Home Fleet.
- (xi) Exercises to co-ordinate the operations of the air forces under the control of Allied Air Forces Central Europe.

"AJAX"

CHAPTER XXVII

THE FUTURE INFLUENCE OF AIR POWER

THE CLOUDY OUTLOOK

WHAT will be the influence of air power upon the issue of a war in the future? That it will be greater than it was in World War II is sometimes taken for granted, but it might well become less, in either of two ways. Its star might be dimmed by the glow of some new constellation in the firmament of war. War might be revolutionised, mechanised still more than it has been, dehumanised. The day of push-button warfare may be at hand. Battles may be won and nations overcome by telemachic agencies far different from any weapons and any operational techniques known to us. Science might give mankind some gift more terrible than the atomic or the hydrogen bomb and some means of employing it other than conveyance through the air. Marvels of unimagined hitting power might come to us out of the waste lands, from Frenchman's Flats in the Nevada desert, from Woomera in the Australian. The air power with which we are familiar, that wonderful integration of human and mineral elements, might become obsolete. Its brief glory might be no more than a memory.

The other way in which the influence of air power might decrease would be because that of the older arms of war increased. That, too, is a possibility. After all, the air arm is an upstart, though a splendid one. It might be "put in its place," not of set purpose or malevolently but because events shaped that way. The older arms are not dead. There is in them a capacity for resurgence which should not be underrated. Nations who want to fight, given geophysical facts, must march and sail and fly to do so. Otherwise they could not be at one another's throats. Mostly—again it is a matter of geophysics—they will march, so armies will be necessary, though fleets and air forces will be needed to support them. That was Hitler's attitude to the question. It came up one day in the course of his table-talk. He disposed of it summarily. "The arms of the future?" he said. "They will be, first, the land army, next the air force, thirdly, sea power."* What is will continue to be. It is a common enough conclusion, but, unless carefully qualified, an unwarranted one. The role of each arm of war is not as static as it implies. It is, in fact, changing all the time. It may change more rapidly in the future. Of Hitler's categories we in this island would probably give sea power the first place still. Many of us think, nevertheless, that the day will come when the air arm will challenge its lead, which is far from saying that navies will cease to matter. It is only that the order of priority among the three arms is not fixed eternally, and the day of the air arm's supreme glory is still to come.

* *Hitlers Tischgespräche im Führerhauptquartier, 1942–42*, edited by Dr. Henry Picker, Bonn, 1951, p. 131.

AIR POWER IN THE ASCENDANT

In August, 1945, there were some who thought that that day had come already. The destruction of Hiroshima and Nagasaki seemed to have wiped out not two cities only but the kind of war and its weapons which we had known. For the time air power was on top of the world. The atom bomb had put it there. "The influence of atomic energy on air power can be stated very simply," said General H. H. Arnold, Commanding General of the United States Army Air Forces, at the time. "It has made air power all-important" * The combination of the great bomber and the new bomb was the ultimate, the decisive instrument of war for which men had been waiting so long. It would shorten war, make victory for the possessor of it certain, save millions of lives on balance. "Ah," said some in the United States, "if we had only had it for Doolittle's raid on Tokyo we could have knocked out the Japanese in April, 1942." And not in America only was it thought that the international equilibrium which is the balance of power had been upset by what had happened in Japan. A British visitor to Sweden at the time has recorded that great publicity was given in that country to a suggestion that "the atomic bomb had reduced Russia to a second-class Power overnight." "Day after day the Swedish Press was featuring on its first pages new details about the atomic bomb, with always the implication: 'That'll teach the Russians!'" † There was some tendency in Britain, too, to assume that it would enable the West to call a halt to the greedily encroaching Russians, to issue an ultimatum to them: "Get back to your own East end of Europe, live in a slum there if you want to, but leave us civilised peoples of the West alone."

THE GLOBAL BOMBING CONCEPT

The idea of air power, armed with the magic bomb, as a self-sufficient war-winner harmonised with the mood of the American people after 1945. They were weary of war, weary of overseas adventure, not a little disinclined to seek more of them. Here was the instrument which might make it unnecessary to send expeditionary forces again to Europe and yet would allow the United States to assist the free nations of the Continent in the event of an attack upon them by an enemy whose success would not be to America's advantage. Having the bomb, Mr. Clarence Cannon, chairman of the House of Representatives Appropriations Committee, said at Washington on April 13, 1949, "We won't have to send our boys." Long-range bombing could be the American contribution to the defence of the West. It was never a very definitely formulated or universally accepted concept; the United States Navy, in particular, was loud in its expression of dissent from it. One senior naval officer wrote about it: "Most of our operational plans revolved around the bomb, envisaging as they did a trans-continental war in which huge planes would take off from the scattered fields of the Strategic Bomber Command in the United States, carry A-bombs to carefully chosen targets in Russia,

* General Arnold's *Third Report* to the Secretary of War, dated November 12, 1945, p. 67.

† Alexander Werth, "The Outlook in the U.S.S.R.," address at Chatham House on October 10, 1945, *International Affairs*, January, 1946, pp. 38-39.

return to the United States and report to General LeMay, 'Mission accomplished, sir, the war is won.' It was frequently painful and distressing to listen to young Air Force generals expounding and defending this theory, apparently convinced that it was a good one and that it would work." *

Still, America's monopolist possession of the bomb in these post-war years may have had some effect in deterring a Russian adventure that might have been attempted. How far it did so, how far it saved Western Europe from being overrun, is a debatable question. How far, *per contra*, it served to increase the international tension of which such an aggression might have been the more or less accidental outcome, is an equally debatable one.

SECOND THOUGHTS ON THE A-BOMB

In the autumn of 1949 the position changed. It was announced by the White House on September 23, that an atomic explosion had taken place in Russia. American monopoly of atomic weapons seemed to have passed; it was not stated whether the explosion was that of a bomb, but the general assumption was that in fact it was. "Russia's possession of the atomic bomb," a British correspondent at Washington reported a little later, "has already somewhat altered American strategic planning in that greater emphasis is now being placed on defence preparations. On the whole there is a much more sober evaluation of the importance of this weapon." † The movement back towards conventional armaments was accelerated after the North Korean aggression of June, 1950. "Korea," an American editorial writer said, "has torn up the military policy which ruled in this country from 1945 to 1950. . . . The new policy is no longer formed around the atomic bomb; it is formed around ground troops." ‡ A little earlier Mr. David E. Lillienthal, the former head of the Atomic Energy Commission, warned his countrymen that "the atom bomb has been overvalued in the popular mind as a guarantee of victory in the case of war. In the five years since Hiroshima this country has slipped into a dangerous preoccupation with the atom bomb. This preoccupation has led us to believe that the bomb was not only a great weapon but a decisive one." It could inflict vast and terrible damage on Soviet cities and industrial centres, but it would not prevent Russia's armies from overrunning and occupying Europe. § The last consideration was very much in the minds of the Western European nations who were likely to be the first victims of Russian aggression.

They did not welcome the suggestion that their salvation should depend wholly or largely on American air power. That meant, no doubt, ultimate deliverance, but in the meantime it meant almost certainly an irruption which there was little prospect of stemming. What they asked for was not deliverance but protection on their frontiers. In a speech to the English Speaking Union in New York on November 29, 1949, Field-Marshal Viscount Montgomery said: "The point that is fundamental is that a promise to rescue the West in due course after a successful invasion from the East is quite useless. If the West is overrun again, that is the

* Rear Admiral Ellis M. Zacharias, *Behind Closed Doors*, 1950, p. 271.

† O. H. Brandon in the *Sunday Times*, November 20, 1949.

‡ Walter Millis, in *Foreign Affairs*, April, 1951, p. 379.

§ Mr. Lillienthal's statement was quoted in the *Daily Telegraph*, January 26, 1951.

end of the peoples who live there." * If they were not to be overrun, ground forces would be needed, and to these the United States would have to contribute if they were to be sufficient to hold the line.

THE FACTOR OF PROVOCATION

Here there entered into the problem of defence a complicating factor which seemed likely at first sight seriously to diminish the influence of air action in a future war. It was the "factor of provocation," a very important one to which too little attention has been paid in discussions of the factors affecting western defence. The "factor of provocation" is the expression originally used by M. Claude Bourdet, editor of the weekly *L'Observateur* and one of the leaders of the neutralist group in France, to denote a limitation upon a country's freedom of action in the organisation of its national security. Reduced to mathematical terms, he says, security can be defined as "the product of material strength multiplied by moral unity, the total being divided by 'the factor of provocation.'" † The neutralists' view is that the rearmament of Western Europe on a great scale with American aid is as likely to provoke war as to prevent it. They are specially nervous about the Russian reaction to the provision of American air bases in French territory. There is little likelihood that any Government committed to a neutralist policy will come into power in France.

There is, however, every possibility that if war does come the factor of provocation in another shape will be found figuring in the strategic problem that will demand solution. The effect of it will then be to discourage the use of certain methods and instruments of war which might prove to be boomerangs. For that reason it may well dictate the pattern of the war if it comes. The war is commonly conceived as one in which long-range air attacks will be primary operations. Flaming and devastated cities, we are warned, will be prominent features of it, and the urban casualties will run into millions; air raid precautions here and in other countries are based on that expectation. The picture is a more lurid and terrifying copy of that portraying what happened in Germany in 1943-45 and in Japan in March-August, 1945. It is not a pretty picture. It is, however, no more than guesswork. It may be wrong. That is because it takes no account of the factor of provocation.

It was the working of that factor which led to the inaction of the British and French Air Forces when they might have helped Poland by making diversionary attacks on Germany in September, 1939. So long as France was in the field her influence was exerted strongly against the raiding of the interior of Germany. "The French Government," says Mr. Churchill "requested us to abstain from air attack on Germany, stating that it would provoke retaliation upon their war factories, which were unprotected." † M. Daladier told Mr. Churchill later that "no aggressive action must be taken which might draw reprisals upon France." Mr. Churchill makes the comment: "This idea of not irritating the enemy did not commend

* Quoted in *The Times*, November 30, 1949.

† Carnegie Endowment Publication No. 472, June, 1951, "Neutralism in France and Germany," p. 295.

† *The Gathering Storm*, 1948, p. 330.

itself to me."* But one can see the French point of view. If France had not collapsed in June, 1940, there would quite possibly have been no air attacks on German towns. The French Government was always apprehensive about the German ripost to an air offensive. It knew that if German towns went up in flames its own would too.

A POLICY OF RESTRAINT

In the event of war between the Atlantic Powers and the Soviet Union similar doubts will probably be felt in France about the bombing of Russian centres of population. The safety of Paris will be an uppermost consideration in the thoughts of the French Government. The French Army will be the core of the Western defence on the ground, and France's voice will be powerful in Allied counsels. The Belgian, Dutch, Danish, and Norwegian Governments will think about the safety of their own cities. So will the Germans about theirs, and their views will carry weight; the Federal Republic is likely to have joined the North Atlantic Treaty Organisation, and its troops will probably be in the Western line, at all events in the integrated form. They will know more than any people on earth about what will then be the most important thing in the world, the transformation of a horribly thick Red line into a thin one. They did that kind of thinning to the tune of something between six and eight millions of Red soldiers killed in 1941-45.† The other nations are, in comparison, mere beginners at that game. It is the Wehrmacht that the Russians fear, with reason. Perhaps we and other nations may have reason to fear it again some day, but meanwhile what remains of it is on our side, for which we should be thankful. It will help, one hopes, to keep the new enemy farther away from us than he might otherwise be. Even so, there will be a good deal of not unnatural disquiet about the country's exposure to a ripost in the air. Indeed, it exists already. Mr. Churchill gave expression to it in his speech in the House of Commons on December 6, 1951, when he said that the establishment of "great and ever-growing air bases in East Anglia" for use by American bombers "places us in the front line should there be a third world war." We were ready, he said, to accept that risk, but we must recognise its reality. British cities would be less vulnerable than those on the Continent if the Russians could be prevented from obtaining bases on the narrow seas. The opposition in other countries to the carrying of the air war into Russia would still be strong enough, in all probability, to make agreement on the adoption of an air strategy similar to that adopted against Germany difficult to reach.

The air strategy then adopted was primarily a city-wrecking one. If cities are, as such, not attacked, what becomes of the strategic offensive as conceived in the last war? If target area attacks on centres of population are abandoned by common, if tacit, consent, not much of the air strategy with which we became familiar then will be left. Will not air power lose most, if not all, of its influence upon the course of a future war? Paradoxically, no; its influence will probably be greater than ever. That is a hard saying. Whether it is justified what follows will show.

* *The Gathering Storm*, 1948, p. 454.

† D. J. Dallin, *The Real Soviet Russia*, 1947, p. 283.

HOW STRATEGIC BOMBING BEGAN

The strategic air offensive in World War II began with attacks on oil and transportation targets. On the night of May 17, 1940, Whitley bombers of the Royal Air Force raided oil targets at Bremen, and Hampdens raided others at Hamburg. This was the first strategic air attack of the war.* It is an historical fact. One cannot dispose of it by trotting out these two wheezy jades, the German attacks on Warsaw and Rotterdam. The normal addendum that 30,000 people were killed in Rotterdam does not improve the argument; actually the true figure was about 800, but that is not the point. It is that the Warsaw and Rotterdam raids were not strategic at all. They were connected immediately with ground operations aimed at the capture of the two towns. In other words, they were tactical. The difference in principle between strategic and tactical air action is well understood by all acquainted with the subject. The difference tends to disappear, or at least to be reduced, when attacks are made on communications in an army's rear; but the sustained attacks by the Royal Air Force on the Hamm marshalling yards were strategic in so far as their purpose was to affect production in the Ruhr.

In the summer of 1941 our bombing policy underwent a change. It was decided to switch from oil and transportation as objectives to centres of population and the new policy was put vigorously in force in the spring of 1942. Target area bombing began in the form of incendiary attack. The raid on Lübeck on the night of March 28, 1942, marked the inauguration of the fire-raising campaign. Lübeck was "the first German town to be devastated by fire. . . . It was, in effect, the first raid in which the great destructive power of incendiary bombs was effectively demonstrated."† That statement is correct so far as towns in Germany were concerned, but fire-raising had been very effectively practised in some of the German raids on London, notably in that of the night of December 29, 1940.

THE URBAN DESTRUCTION

The damage caused by the air raids on German towns was mainly due to fires, not to explosions; the United States Strategic Bombing Survey put it at the very high figure of 75 to 80 per cent. of the total.‡ There can be little doubt that the buildings which suffered were for the most part of no military significance; fire is inevitably indiscriminating. It was in the nature of things that there should have been a vast amount of destruction which was of no advantage to the Allies' cause. There is indeed a good deal of difficulty about giving a confidently affirmative answer to the question which a distinguished naval officer has asked about the widespread devastation caused by the air raids on Germany: "Was so much of it really necessary or expedient?"§ Even the industrial damage was largely of little military importance. "The losses inflicted by area attacks fell mostly on industries relatively unessential to the war

* The first bombs aimed at targets on the mainland of either Germany or Britain were those dropped by Whitley bombers in the Goch, Gelden, and Wesel areas on the night of May 10, 1940, but that was a tactical and not a strategic operation.

† W. J. Lawrence, *No. 5 Bomber Group R.A.F.*, 1951, p. 63.

‡ *Over-all Report (European War)*, p. 93.

§ Admiral Sir Gerald Dickens, *Bombing Strategy*, 1947, p. 85.

effort."* Dr. Vannevar Bush has expressed the opinion that "general bombing was not worth the extreme cost and effort it entailed," whereas "selective bombing of key facilities of transportation, fuels and critical manufacture . . . very decidedly paid dividends."† General H. H. Arnold's view was that "indiscriminately widespread destruction of enemy industry is simply a waste of effort."‡ The fact that Germany's war production increased steadily until mid-1944 is an indication that the bombing policy adopted was at least not productive of very quick results.

THE CAMPAIGNS AGAINST OIL AND TRANSPORTATION

It was only in 1944 that the Royal Air Force—returning to its first love—and the United States Army Air Force put in hand the massive campaigns against German oil and transportation which were to reduce the Wehrmacht to immobility and to disrupt Germany's economy. What, a French military writer has asked, would have happened if the whole weight of the 2,106,000 tons of bombs that were dropped by the two air forces on enemy targets in Europe had been concentrated on these two classes of objectives? § Perhaps that question, with its implication, is not an altogether fair one; it invites an answer that would amount to an over-simplification of a very complex matter. We in this island cannot forget that Bomber Command's operations drove the air war into the enemy's air and tied down in Germany an enormous defence force to protect the cities there, while our own town-dwellers were spared *pro tanto*. A much more sustainable proposition would be that if the great Allied onslaught on oil had started at the same time as, or a little before, that on transportation, the war would have ended earlier. The Allies decided in the early spring of 1944 to give priority to the campaign against transportation in preference to oil; now—but this is to be wise after the event—it seems that *both* of these classes of objectives could have been concentrated upon if a substantial part of Bomber Command's effectives had not continued to be employed on city-wrecking; and such concentration would have been quite compatible with the giving of adequate bombing aid to the "Overlord" invasion. Actually, the urban attacks were maintained on a large scale throughout the last twelve months of the war; || the return for the effort involved and for the destruction caused by them, notably at Dresden, was highly problematical.

German experts interrogated after the surrender thought that if the

* U.S.S.B. Survey, *Over-all Report*, p. 74.

† *Modern Arms and Free Man*, 1949, p. 96.

‡ *Third Report*, November 12, 1945, p. 62.

§ Colonel de Tarle, *Reflexions sur les bombardements stratégiques en Europe*, in *Forces Aériennes Françaises*, September, 1948, p. 764.

|| In the six months April to September, 1944, inclusive the following towns outside the Ruhr, the case of which was exceptional, were heavily bombed, some of them twice, some thrice: Brunswick, Munich, Friedrichshafen, Kiel, Stuttgart, Russelsheim, Stettin, Bremen, Darmstadt, Emden, Koenigsberg, Münster, Frankfurt, Osnabrück, Karlsruhe, Kaiserslautern, and Bremerhafen. In the succeeding six months, to April, 1945, there were heavy raids on Brunswick, Stuttgart, Nuremberg, Dresden, Chemnitz, Dessau, Cologne, Hanau, Hanover, Magdeburg, Wiesbaden, Heilbronn, Koblenz, Bonn, Hildesheim, Worms, and Würzburg; Essen and the other Ruhr towns were still being bombed repeatedly. Some of the attacks above referred to were part of the campaign against transportation, but they were not confined to the railways and were in fact target area attacks.

all-out attack on oil and the chemical industry had begun six or twelve months earlier than it did the end of the war would have been advanced proportionally; statements to that effect made by Field-Marshal Milch, Dr. Rischer, and Dr. Hotlage were quoted by Mr. John Strachey, the Under-Secretary of State for Air, in the House of Commons on March 12, 1946.* Albert Speer's statement under interrogation that the attacks on the synthetic oil industry would have sufficed by themselves to render Germany powerless, has frequently been quoted.

That the American Air Force's attacks on oil targets should have begun much sooner than they did was one of the conclusions reached by the United States Strategic Bombing Survey in its report on the air offensive in Europe. A similar view has been expressed in regard to the Allied offensive as a whole by a distinguished British officer who was especially well qualified to speak. "Spaatz," says Major-General Sir Francis de Guingand, referring to the inter-staff discussions in the spring of 1944, "pressed for an earlier start" of the bombing of oil targets, "and in view of the great success that was eventually achieved and remembering the vital effect it had on the German collapse, it would have paid us well."† It is not unreasonable to suggest that it might have brought the war in Europe to an end—especially if the blunder of Casablanca had not been made a year earlier—at the time of or not long after the attempt on Hitler's life, in July, 1944. If it had, the situation in the post-war world would probably have been vastly different—for the better—than it actually has been.

SELECTIVE BOMBING

The truth about all that happened in World War II cannot be told even now. The full disclosure of it will probably have to wait until all the prime actors in the great drama have passed away. Even the official histories will have to be tactfully discreet. Mistakes were made in a number of instances and still remain unexplained. Many were made before the war, for that matter, and have never been explored. The amazing story of the accumulation in 1936–39 of a stockpile of Battle medium bombers which were only fighter fodder has still to be told. So has the inside story of the wrong turning which our air strategy took in 1942. It would have been better if we had diverged less sharply from, or returned sooner to, the strategy with which we began. If we profit by the experience then gained, we shall do little city-wrecking in a future war and concentrate rather on key objectives, which are largely non-urban. It will pay us better. Such a policy would chime in with the demand which, as already stated, the Western Continental nations will probably make for a restriction on the bombing of cities. The effect should be not to diminish but positively to augment the influence of strategic bombing on the course of a future conflict. It will have the result that the attacks will be more selective and discriminating. They were not always such in the last war. "The ruins of Europe's and Asia's cities may be a monument to the frightfulness of modern war. They are also a monument to poor aerial planning and strategy."‡

* *Hansard*, vol. 420, col. 966.

† *Operation Victory*, 1947, p. 363.

‡ S. T. Possony, *Strategic Air Power*, 1949, p. 62.

There will be, of course, other strategic objectives than oil targets (synthetic plants, refineries, benzol plants) and transportation (railway junctions, marshalling yards, bridges, repair shops, canals, locks). The enemy's electric power plants will be an obvious choice, and so will his atomic plants unless, of course, these are by that time internationalised under the Baruch scheme and, which is equally important, have not been occupied by the enemy on the outbreak of war. Aircraft factories are also likely to be high on the list of objectives; so are submarine building yards. There will be, in fact, a sufficient number of special or key objectives to keep the Allied bombers fully occupied and to leave them no time for wrecking towns in general.

MARITIME TARGETS

At sea Allied air forces will have missions in plenty to execute. In a war with an enemy weak in surface warships there may not be opportunities to repeat the triumphs which the American naval aircraft won at the battles in the Coral Sea and at Midway Island, Guadalcanal, and Leyte in 1942-44. If the enemy is strong in the submarine arm, and he may be far stronger here than Germany ever was, the Allied aircraft, land-based and carrier-borne, will have good hunting to save their crews from boredom. Here again, under the sea as on the surface of the land, what will matter will be the killing of Russians. That was what mattered when the German menace had to be mastered. The toll of life among the submarine personnel was an appalling one. "Of 40,000 German naval personnel who manned the submarines, 30,000 were lost in action—in truth a frightful proportion."* One almost begins to pity Russia's doomed submarine men, tracked down in that future killing ground, the gap of the north, and left to die there by inches on the bed of the sea. The slaughter may be greater than it was in the last war. The air arm will play a big part in the grim drama. In the last war 50 per cent. of the U-boat losses were due to air action; the percentage may be higher in the next war. Here is another sphere in which the influence of air power should grow.

ARMY CO-OPERATION

In the tactical use of aircraft there will be in all wars, minor as well as major, abundant opportunities for the third arm to influence the course of the struggle. World War II proved conclusively that armies which fight without strong air support are grievously handicapped. The lack of overhead cover has effects which are not only physical but moral. This was shown in the operations in northern France in 1944, when the German soldiers were reported to have a sardonic saying that if you saw a silvery plane it was American, if it was dark it was British—and if it was invisible it was German. The role played by the Allies' tactical aircraft in these operations was generously acknowledged by General Eisenhower. It will probably be a more prominent one still in a future war. The use of aircraft for conveying troops and equipment to the battle front will also become increasingly important, especially in

* Vice-Admiral Kurt Assmann, "Why U-boat Warfare Failed" in *Foreign Affairs*, July 1950, p. 670.

peripheral wars of the Korean type. The promptness with which reinforcements were moved by Hastings aircraft to the Suez Canal zone from Britain, Cyprus, and Tripoli in November 1951, was a further indication of the usefulness of air transport in circumstances of international tension, and here too the future may witness big developments.

It may also see increased resort to the use of aircraft for the landing of troops on the far side of the front, in enemy ground. The danger of paratroop descents in this country on a formidable scale in a future war was referred to by Mr. Churchill in the House of Commons on December 7, 1951. It was for this reason, he said, that the Home Guard had been revived and the Royal Observer Corps was being strengthened. In paratroop operations the air arm is concerned in two capacities, as the transporter of the troops to be landed and as the interceptor of the aircraft conveying them. Airborne operations were well tried out in the last war and the experience then gained should lead to further successes in another war. Here again, the influence of a particular form of air power is likely to be greater than ever.

DETERRENT AIR POWER

The way in which air power could exert its greatest, and most welcome, influence upon war in the future would be in helping to ensure that there is no war in the future, at any rate, no war of the big maps. Its deterrent and preventive quality could be more important than the capacity for actual war-making. The only major war to be feared in the foreseeable future would be one between the Soviet Union and the Atlantic Powers. In World War I much was heard of the "Russian Steam Roller." It is not a steam-roller any longer. It is a diesel-engined bulldozer. There are huge masses of men behind it, but it is the spearhead of the Soviet attack. If the Red war-lords see that any aggression is likely to be held up by strong Western forces on the ground and the mechanised vanguard to be soon immobilised as the result of massive air attacks on the fuel oil centres upon which it depends, the Kremlin may stay its hand. Air power will thus have contributed to the prevention of a global war, the kind of war that matters most of all. Minor conflicts there still may be, but these will be less calamitous for mankind. In time they, too, may pass; to bring it about that they should may be the supreme task for air power. It would be a strange turn of fate if the integrated air power of the peace-desiring nations, and they are nearly all nations, were some day to be awarded the Nobel prize for peace. That, however, is to look very far ahead. There are great waves of opposition to meet, stormy seas to sail. World peace is the Golden Fleece. The seekers of it are Argonauts fighting with the tide.

J. M. SPAIGHT

CHAPTER XXVIII

AIRCRAFT DEVELOPMENT

THE YEAR'S DEVELOPMENTS

IT HAS been a wonderful year in the development of military aircraft in this country and in the United States of America; this great increase in the number of new types developed is largely due to the cold war, and it is interesting to note in Jane's "All the World's Aircraft" the number of pages allocated to new designs produced in Great Britain and the United States of America compared with those which, in time, penetrate the Iron Curtain. Thus, in 1950 the number of pages of Allied aircraft was thirteen times as many as those produced by Russia. In 1951 the figure was twenty-seven times as much.

At the top of the list of developments would appear the Hawker P.1067, described by a generous American expert as the finest fighter in the world; just as remarkable in its own way is Supermarine 508. Both of these were seen at Farnborough in September, 1951. Reference may also be made to the first de Havilland twin-engined fighter, D.H.110; and the first twin-engined delta, Gloster G.A.5.

Progress in jet-bombers has been even more spectacular. Four types have been in progress in this country for some time, and now the first two have emerged; a production order has been placed for Vickers Valiant, while Short Bros. & Harland's S.A/4 is still undergoing evaluation trials, doubtless leading to further experiments with different types of engines and radar equipment. In the United States of America developments of Boeing B.47, "The Atom Bomber," and also of Consolidated Vultee B.36, the largest military aircraft in the world, have led to the production of Boeing B.52 and Convair Y.B.60, both eight-jet aircraft powered by the Allison J.57, reputed to be capable of 10,000 lb. thrust.

Though there have been rumours of jet-bombers designed in Russia, there is little concrete evidence up to the present; and their best bomber is doubtless the B.29, of which a Chinese copy was made by Tupolev; it is said that he was not very proud of this copy, and usually refers to it as "Mr. Boeing's fine old aircraft."

But there is no doubt whatever about the quality and the quantity of the aircraft generally known as MiG.15, styled in Russia Mi.11. Previous MiGs. were the product of the team of Mikoyan and Gurevitch; although Gurevitch, in a lecture to some Russian engineering society, claimed some of the mathematical credit for this fine fighter, it seems likely that the team parted company before the aircraft reached the drawing-board.

The next most important developments have been in anti-submarine aircraft of all types; detection of a submarine when only the schnorkel is on the surface of the sea involves radar equipment of great power and weight; and the most suitable anti-submarine aircraft will be those capable of carrying this great weight as well as appropriate armament to destroy the submarine when found.

The United States of America seem to have a complete answer to the

problem in their long-range Convair flying-boat with gas turbines; fitted instead with compound engines it would be ideal. Other solutions are only partial ones: long-range, carrier-borne aircraft such as Lockheed Neptune, with good crew accommodation, are the next best; Fairey Gannet is a combined strike-fighter and anti-submarine aircraft, perhaps the best of its type in the world, but not 100 per cent. suitable for anti-submarine work on account of its inability to remain at sea for a day or two; a similar disadvantage applies to the Grumman Guardian, equipped for anti-submarine defence by using a pair of aircraft, one to search and one to kill. The prime intention might have been to find an efficient use for a number of torpedo-bombers left over from the war; but the fact remains that the cost of this pair in manufacture, radar equipment, engines, fuel, and crew is probably more than a single-package flying-boat at least equally capable of doing the same work.

As a result of the war in Korea, there has been a considerable development in tactical aircraft; and the English Electric Canberra has been applied to this purpose. In the United States of America great resources have been diverted to the production of ground support aircraft; and these include a three-jet medium bomber such as Glenn Martin X.B.51; a high-speed intruder such as Canberra is the next requirement; a smaller heavily armed ground-support aircraft such as Thunderjet forms the next line of tactical support aircraft; and finally, ground-to-ground guided missiles should come into their own if the war were unfortunately to continue very much longer.

Korea has been responsible also not only for the application of helicopters to rescue by land or sea, or as a high-speed ambulance, but lately to assault purposes; in *Flight* for February 22, 1952, there is a review of exercises from a United States Navy aircraft carrier applied to use as a helicopter carrier. In addition, the great helicopter firm of Piasecki is producing a 22-seat helicopter solely for the purpose of assault-transport.

MEANS OF PROPULSION

Although the development of atomic power for aircraft has been proceeding for years in the United States of America, it was only at the end of 1951 that statements were issued which proved to be rather more detailed than anything previously disclosed.

The United States Air Force and the Atomic Energy Commission said that their basic research had been completed, and manufacture had been entrusted to the General Electric Company in the United States of America.

About that time Dr. Miles Leverett was permitted to give a paper before the Institution of the Aeronautical Sciences entitled "Aircraft Nuclear Propulsion." He said that atomic energy was available as heat, and power for aircraft would consist of the reactor or heat source, suitably shielded to protect the crew from radiation; and then heat machinery to convert the heat into propulsive thrust. His paper dealt with the difficulties of pumping hot and slightly radioactive fluid to engines in the wings. He added that the shield would be the heaviest single item; and thought that wings of future aircraft would have to be specially designed to take the concentrated weights of shield and reactor. Weight of fuel would be negligible, replacing fuel weights of the order of 75 tons in the largest aircraft. In this country a report of the lecture appeared in *Flight* of March 21, 1952, on

page 330. It has been announced that in addition to the atomic engines produced by General Electric of United States of America, Pratt and Whitney have also been entrusted with similar work.

As regards turbojets, no great development has been disclosed; but it is known that Bristol have in hand a very large turbojet styled Olympus. An American journalist being shown round their factory noticed that the thrust-balances were graduated up to 15,000 lb., doubtless allowing for after-burning; and so in the United States of America it is assumed that Olympus may develop at least 10,000 lb. of static thrust, dry.

Unless it does so, it will not be the most powerful engine of this type in the world. In the March, 1952, issue of *Aero Digest*, Allison announce their J.71-A-1 of 9,700 lb. thrust, with cannular-type combustion chamber; and in the same number General Electric refer to their J.73-GE-1, formerly J.47-GE-21, of 9,000 lb. thrust. In addition, not illustrated in *Aero Digest*, Allison J.57 has been mentioned as providing the power for the immense new bombers mentioned above; and it is believed that these engines also are of the order of 10,000 lb. thrust.

But the year's most interesting engines are those in which considerable fuel economy is attained by using piston engines in conjunction with turbines. One of them, the Napier Nomad, was seen at Farnborough in 1951; it is understood to develop 3,000 shaft horsepower, with a dry-weight of 3,000 lb. and a fuel consumption variously estimated as being between 0.36 and 0.39 lb. per b.h.p. per hour of shaft horsepower. This engine is a diesel, burning heavy oil; it is supercharged by means of a compressor driven by a turbine, with sufficient excess horsepower to drive half of the contra-rotating propeller, the other half being driven by the diesel engine itself.

In Jane's "All the World's Aircraft" of 1951-52, on page 80(d), Wright Turbo-Cyclone 18 is illustrated and described. This engine has three exhaust turbines, and is said to convert into useful power about 20 per cent. of heat energy normally lost. The consumption of fuel has been stated as 0.36 lb., exactly the same as Nomad.

Not illustrated in "Jane," or in the "Aero Digest Annual Directory" of March, 1952, the Pratt and Whitney compound engine has been referred to in the Press; it is probably similar to the Wright, and the only information available at the time of writing is that its petrol consumption is the same.

The firm of Marquardt is still producing large ram-jets, and some of them have been applied to guided missiles; they are also used as means of propulsion for helicopters, by their being mounted at rotor tips. Presumably for the other purpose, one of these 48-inch diameter ram-jets develops 15,000 horsepower.

Both in this country and in the United States of America famous firms such as de Havilland and Reaction Motors Limited have developed specialised methods of take-off; the de Havilland Sprite will deliver a continuous thrust of 5,000 lb. for an empty weight of 350 lb. Control can be exercised by throttling the compressed air supply which forces the propellant to the combustion chamber. The corresponding Reaction Motor's rocket motor produces a thrust of 6,000 lb. for a little over 3 minutes; its dry weight is only 210 lb., and it was applied to the Bell X.1. rocket-powered single-seat research aircraft, for which a speed of 1,700

miles per hour is claimed, at 60,000 feet. But the rocket endurance is not more than $2\frac{1}{2}$ minutes. The power output of this motor is controlled by selection of the number of cylinders to be fired at any one time, giving thrusts of 1,500, 3,000, 4,500, or 6,000 lb. for one, two, three or four cylinders respectively. If the cylinders were used consecutively instead of concurrently, endurance at about 1,500 lb. thrust would be nearly 10 minutes.

TWIN-ENGINED JET FIGHTERS

This has been a good year for fighters, bringing many newcomers to Tables I and II (p. 336). Nowadays any particular type of fighter may have several variants: Gloster Meteor exists as day fighter, night fighter, Sea Meteor, ground attack fighter, reconnaissance fighter, high-altitude unarmed reconnaissance aircraft, and trainer. The de Havilland Venom spans a similar range, and so does North American Sabre. So these two Tables now show twin-jet and single-jet fighters respectively, instead of day and night fighters.

Three new twin-jet British fighters are remarkable for their considerable thrust and horsepower, made possible by the use of great engines such as Rolls-Royce Avon, or Armstrong-Siddeley Sapphire, the engine originally designed by Metropolitan Vickers. Some United States engines are even larger, but they have not yet been applied to fighters. At the high speeds attained by modern fighters a pilot may have 25,000 horsepower beneath his throttle hand, as in the Gloster delta-wing, Sapphire-powered G.A.5, a multi-purpose fighter like its predecessors.

It seems that it will be intended for long-range, day or night and all-weather combat; and as this function demands a considerable radar equipment, the G.A.5 will presumably be a two-seater in some of its variants.

At the time of writing little information is available; but Mr. Percy Crabbe, General Manager of Gloster, says:

Since the war we have been building Meteors in a variety of developments. However, whilst Meteor production has been going on, we have been steadily at work in our design and experimental departments on new aircraft just as versatile as the Meteor but adapted for the maximum use not only of current jet power but foreseeable power into the future.

The G.A.5 delta is our answer to this vital design-problem. The low aspect-ratio of the delta wing provides minimum change in stability and control characteristics at sonic speeds. The delta plan-form permits engines, undercarriage, fuel and equipment to be contained inside one smooth envelope and the shape permits a very rigid and economical construction. The airframe design itself is the corollary to the immense power demands of the twin Sapphires.

The recent Avro demonstrations of their experimental 707 deltas were convincing proof of the capabilities of this plan-form. There has been a complete interchange of research information between ourselves and Avros on deltas, and since Armstrong-Siddeley is another sister company in our group, there has been extremely close liaison between our designers and the Sapphire jet-engine team at Armstrong-Siddeley.

The G.A.5 is the world's first twin-jet-engined delta. We believe it marks another significant milestone in the lead of British aviation over the rest of the world.

The second new British twin-jet fighter is the de Havilland D.H.110, stated to be a day and night fighter like the new Gloster. On its maiden flight on September 26, 1951, the pilot was accompanied by an observer,

from which one may deduce that this powerful fighter also will have one or more two-seater variants.

It carries fighter development a step forward by combining very high performance with modern electronic navigation and combat aids. It is fitted with two Rolls-Royce Avon jet engines and combines the well-known de Havilland twin-boom principle with sharply swept-back wings.

A third newcomer is the Vickers-Supermarine 508, a single-seat monoplane fighter powered by two Rolls-Royce Avon engines. It is designed as an interceptor, having a very high rate of climb and yet retaining a good endurance for operation from carriers. The folding wings are fitted with special high-lift devices ensuring low landing speed and low speed controllability, which are essential for a deck-landing aeroplane.

This single-seater is stated to be the fastest and most powerful fighter ever designed for aircraft carrier operations. When flown at Farnborough in September, 1951, it was noticeable for its rapid climb and high rate of roll. The folding wings are slightly tapered; and further development might extend to swept-back surfaces.

Continuing to deal first with the twin-jet fighters, other types of Gloster aircraft have been prominent during the period under review, all descendants of the first Meteor. Though this twin-engined fighter was the first jet aircraft to be operationally employed by the Allies in World War II, the installation of power units of increasingly greater thrust has ensured its continued predominance amongst the world's military aircraft. One of the latest versions, fitted with two Armstrong Siddeley "Sapphire" turbojets of 7,200 lb. thrust each, is the world's most powerful single-seater fighter.

In 1945 and again in 1946 new world air speed records of over 600 m.p.h. were established by the standard Meteor 4 version. A Gloster Meteor 8 also holds the world air speed record for the 1,000-km. closed circuit at 510 m.p.h. With its initial rate of climb of 7,000 feet per minute, the Meteor is still one of the fastest climbing interceptors in service in any air force. Fitted with Rolls Royce Avon engines, a Meteor has climbed to 40,000 feet in approximately 4 minutes, which, were there such a category, would undoubtedly qualify this aircraft for yet another record.

On the standard fighter version Meteor 8 four 20-mm. Hispano cannons are carried in the nose, two on each side of the cockpit, whilst in addition either two 1,000-lb. bombs or sixteen 95-lb. R.Ps. may be carried externally under the mainplanes. Extra fuel may be carried in a 180-gallon ventral drop tank and, alternatively to the bombs or R.Ps., in two 100-gallon underwing tanks.

A private venture version of the basic Meteor 8 has also been produced by Glosters, specifically adapted for intensified ground-attack operation. On this aircraft provision is made for carrying an increased armament load of either twenty-four 95-lb. R.Ps. or four 1,000-lb. bombs together with the standard armament of four 20-mm. cannons. Wing-tip tanks are fitted, and in place of the external armament underwing and ventral drop tanks may be carried, providing 380 gallons of additional fuel for increased operational range or ferrying duties. Provision is made for R.A.T.O.G. and also, if required, for a ground arrester hook. A further useful innovation is the special pack containing an additional two cannon and ammunition, which may be mounted under the centre section. Even with such a

formidable war load it is possible to operate this aircraft from short forward airstrips hastily improvised in the vicinity of beleagured or attacking ground forces.

Two features of these powerful British fighters place them in a class apart when they are compared with twin-jet fighters produced by the United States of America or France; their span is small in relation to engine thrust, and their all-up weight has been kept down to a moderate figure. Small span for high horsepower infers reduced drag and the probable attainment of high speed; moderate all-up weight infers a spectacular rate of climb, like the Meteor referred to above, 40,000 feet in about 4 minutes. The span is about 37 feet.

Only one other aircraft in Table I compares, as regards horsepower or thrust, with those already mentioned: this is the Avro Canada C.F.100, or Canuck, a two-seater all-weather fighter likely to be much heavier than new British types. The span is 52 feet, and though Rolls Royce Avons are being fitted at present, the fine engine produced by Avro-Canada themselves, the Orenda turbojet, will in time replace the Rolls.

In this somewhat larger span for horsepower the Canuck corresponds to the heavyweight all-weather fighters such as the French Sud-Est Grognard and the American twin-jets such as Douglas Skynight, Lockheed XF.90, Chance-Vought Cutlass, and Northrop Scorpion, the last with a span of 56 feet and an all-up weight of 30,000 lb. It is true that McDonnell Voodoo spans only 38 feet and weighs less than Meteor; but then, its thrust or horsepower is much less than half that of Meteor. A British fighter-pilot with less than 10,000 horsepower in his twin-jets would feel dreadfully under-engined.

But although British fighters could climb better than America's best, and could doubtless fight better at altitude, the United States still holds the absolute speed record; and they produce fighters by the thousand, while we produce them by the score. Their deficiency in high-power engines will soon be made good, partly from their own designs and partly by the licences granted to them for Rolls Royce, Armstrong-Siddeley, and Bristol turbojets.

The Sud Est S.E.2410 Grognard is another heavy fighter; it is powered by two Rolls Nene engines made by Hispano-Suiza. They are mounted one above the other, like the two pair of Rolls Avon engines in the Short and Harland S.A.4. One striking feature of this fighter is that the crew are almost at the tip of the nose, instead of the cockpit bubble being streamlined in further back. This big aircraft will be an all-weather fighter, but it may be applied to other duties such as ground attack.

Chance-Vought F7U-3 is a swept-wing, tailless, twin-jet, single-seat fighter built for the United States Navy, who permit it to be described as "the fastest fighter afloat." In an article in *Aero Digest* for January, 1952, maximum speed at sea level without afterburning is stated as 676 m.p.h. and with afterburning as 730 m.p.h. The article is noteworthy in that it underlines the enormous fuel consumption due to afterburning:

Afterburner operation results in a 155 per cent. increase in fuel consumption. Afterburner operation on the J.46 results in the consumption of 114 gallons of fuel per minute, so that the entire fuel capacity of the airplane would be exhausted in about 8 minutes, or the time required for the airplane to climb 50,000 feet. It is for this reason that afterburning must be used sparingly, usually only for take-off and briefly in combat.

In flight the aircraft looks like a delta ; but the wings will fold, outboard of the two vertical stabilisers and rudders at the trailing edge of the wing, which eliminate the fuselage tail assembly. "Ailavators," combined ailerons and elevators, provide longitudinal and lateral control. Landing flaps are not employed, but to achieve the relatively slow speeds necessary for carrier landings the "Cutlass" is equipped with leading-wing edge-slats, which, extended during an approach, delay the stalling point and increase the wing lift. Air-brakes reduce speed rapidly when required in manoeuvres and approaches. Incidence, when standing on the deck, is 15 degrees. This fighter is the first in the United States designed, from the start, for use of afterburners to provide added bursts of power for short periods. The controls are hydraulically powered to cope with high speeds.

The total thrust of the two engines, with afterburning, is 16,400 lb., a ratio of thrust to weight which is less than that of any Meteor, without afterburning, equipped with Avon or Sapphire engines.

The Douglas F3D-2 Skynight is a two-seater all-weather carrier-based fighter, with hydraulically folding wings and arrester hook. Pilot and radar-operator sit side by side ; there is an escape hatch beneath the fuselage, but a hatch in the canopy also to provide an alternative escape route if the aircraft is ditched. The armament includes six 20-mm. cannon, and rockets ; search radar is mounted in the nose, and there is also radar equipment for tail warning, interceptor, and gun laying. Auxiliary fuel tanks are provided, but on its internal fuel alone the F3D is said to be the longest-ranging fighter in the United States Navy.

Douglas XA3D-1 may not yet have flown, but it is the largest aircraft ever designed for carrier operation ; its function is stated as "carrier attack." Though the wings sweep back 35 degrees they are made to fold, as does the large vertical tail. It has a crew of four, to handle the search radar mounted in the nose and the twin 20-mm. cannon in the remotely controlled tail turret. Its range is 1,500 miles at an economical speed, and it is "the first aircraft designed specifically for delivering the atomic bomb." This presumably means delivery from a carrier—a Boeing B.47 has been styled "The Atom Bomber" for years ; and some American journals have stated that Vickers Valiant and Short and Harland S.A.4 are also "suitable" for the same purpose.

The Lockheed XF.90 is a single-seat penetration fighter built for the United States Air Force. The leading edge sweepback is 35 degrees ; this large aircraft flew nearly three years ago, in June, 1949, but little has been disclosed up to the present as regards its performance or armament. The wings sweep back at an angle of 35 degrees with a tip-to-tip span of about 40 feet. By contrast, the aircraft is extremely long, stretching approximately 55 feet from the point of its needle-nose to the tail. Tail surfaces themselves also sweep back, giving the aircraft a rakish appearance from the side, with the vertical fin standing about 15 feet high.

McDonnell XF.88A Voodoo is a swept-wing single-seat penetration fighter built for the United States Air Force. It may also be applied to bomber-escort use or as a fighter-bomber. Its armament includes guns, bombs, and rockets ; and it is one of the few heavily armed fighters with six 20-mm. cannon. The firm of McDonnell have been entrusted with experiments on the use of propellers at supersonic speeds ; and a Voodoo XF-88B may be built with a turboprop in the nose.

Northrop F-89D Scorpion is a two-seat all-weather interceptor built for the United States Air Force, with six 20-mm. cannon. Leading edges form a right angle with the centre line of the fuselage when seen in plan; but Scorpion is said to be capable of 670 m.p.h. It is fitted with "decel-erons," ailerons which can split open so as to form air brakes. The tip tanks provide fuel for night research missions, and are unusual in that the forward portion of each houses the rockets.

SINGLE-ENGINE JET-FIGHTERS

Table II shows some of the most advanced single-engine jet-fighters in the world; it does not include those which have been mentioned under the heading of research, nor the Continental fighters other than MiG.15. Now that we know the span, and can make a guess at the weight of MiG.15, one of the reasons for its speed and climb becomes obvious. The ratio of thrust to weight is as high as that of any aircraft of which particulars are available and which is known to be in production; while the span is less than any aircraft in the list. It has been said that de Havilland Venom would be the only aircraft which could take on MiG.15 at altitude, and this accords with the belief that manœuvrability at great height depends on low spanloading, which Venom certainly possesses, and MiG.15 has not.

It is known from experience that North American Sabre has been the most successful fighter to be used regularly in combat with the MiG.15. The success of Sabre is more likely to be due to the computing bomb-sight and long-range accuracy of fire than to any feature disclosed by the figures; Sabre has a bigger span, weighs 50 per cent. more, and has a smaller engine than MiG.15, but despite all these Sabre is still regarded as the fastest aircraft in the world until it is proved otherwise.

The de Havilland range of fighters will long hold a high place in the list of the world's finest fighters. The de Havilland D.H.108, first flown in 1946, was the first British aircraft to exceed the speed of sound; until recently it held the world's speed record over 100 kilometres.

The Venom Mark I is a high-performance day-fighter with an exceptional rate of climb and power to manœuvre at extreme heights. Mark II is a two-seater night-fighter; the cockpit of the latter is modelled on that of the well-proved Mosquito, and the crew sit practically side by side, the radar operator slightly aft of the pilot. The Sea Venom, a modification of this latter type, will give the Royal Navy its first all-weather fighter.

The Venom fuselage is basically the Vampire fuselage in that it takes the Ghost engine without a large increase in diameter, though the increase in diameter of the cowling is quite considerable. Consequently the two-seater night-fighter nose, originally designed for the Vampire, is easily fitted to the Venom, to form the Venom N.F. Mark 2 and the Sea Venom N.F. Mark 20.

For any air force which is at present operating Vampire day-fighters, night-fighter and trainer variants are offered, and with them the Venom range of advanced fighters of outstandingly high performance, aircraft of a design which is readily adaptable for day and night fighting and naval duties. The Venom range becomes expeditiously available without the necessity for any basic conversion as far as piloting, maintenance, and administration are concerned.

"Aeroplanes for to-morrow" is a term by de Havilland to define their range of fighters; but those fighters are available in quantities now and are in use by more than a dozen countries. The most striking of aircraft for to-morrow, ordered from the drawing-board, is Hawker Hunter, or P.1067, seen at the S.B.A.C. Display at Farnborough. It is descended from Sea Hawk through P.1052 and P.1081. P.1052 is a research monoplane with the same fuselage, tail unit, and power plant as Sea Hawk, but with swept wings; P.1081 has the same front fuselage, wings, and landing gear as P.1052, but it has a straight-through jet pipe, to which afterburning can be applied; P.1067 has a long fuselage to accommodate the axial compressor of the Rolls Avon turbojet.

In a generous review of the S.B.A.C. Display at Farnborough in September, 1951, the aviation correspondent of the *New York Herald* said, "The cold facts are that England demonstrated the finest jet fighter and the finest jet bomber operating in the world to-day." The fighter is, of course, the Hawker Hunter, and the bomber the Vickers Valiant.

It is rumoured that the Hawker Hunter is designed for the very heavy armament of four 30-mm. cannon; and it seems possible that the Vickers Supermarine Swift may be equally armed. The Swift is developed from Supermarine types 535 and 510. The latter aircraft was the first swept-wing fighter to operate successfully from the deck of an aircraft carrier. Incorporating a higher degree of sweep-back than other similar aircraft, it can take advantage of the latest engine developments, and the fuselage is designed to accommodate a "re-heat" installation. The Swift will be powered by a Rolls-Royce Avon turbojet.

The Douglas Skyray is so advanced as to be almost futuristic. It has a span of only 24 feet, two-thirds that of the agile MiG.15, an engine power nearly 30 per cent. more, and a high thrust/weight ratio. One would expect it to have phenomenal speed and climb, with the almost entire sacrifice of the ability to fight at high altitude. But as it has been designed as a carrier-borne interceptor, this is not so important as the alternative ability to run down a very speedy enemy.

It is designed specifically for catapulting from the carrier and climbing rapidly to operational height. Initial rate of climb is 15,000 feet per minute, and 50,000 feet would be attained in 10 minutes. At a guess, this would not be better than Gloster Sapphire-Meteor or de Havilland Venom. The engine is a Westinghouse J.40 of 7,500 lb. static thrust, or 10,800 with afterburning. The aircraft, however, can remain in the air for less than 45 minutes, and probably about half that time if afterburning is used for climb and combat.

The Grumman Cougar is a swept-wing version of the Panther carrier fighter. The "thin, swept wings and tail give the Cougar a maximum speed of over 700 m.p.h.;" the aircraft can also be applied to penetration fighting or ground support. It has been in quantity production for nearly a year; and production Cougars were taking the air in less than five months from the first flight of the prototype, an unusual feat for jet aircraft. There are no details of Cougar, and Table II provides dimensions, weight, and power of Panther instead. Grumman refer to Cougar as "another cat out of the bag": previous cats were Panther, Wildcat, Hellcat, Bearcat, and Tigercat.

The Panther, in its latest marks, is being supplied against United States

Navy orders totalling more than 1,000 aircraft; before the end of 1952 it is anticipated that a variable-sweep prototype should be available—Grumman XF-10F.

The Lockheed fighter F.94 which appeared in Table II of the previous volume was powered by an Allison engine of 4,600 lb. thrust; the latest version, F.94C, has the Pratt and Whitney J.48 (the Rolls-Royce Tay built under licence) with a thrust of 6,250 lb. The F.94 series is developed from the Lockheed Shooting Star built in 1943 round a de Havilland jet engine as a single-seat fighter; this was developed into a two-seater trainer, and then an all-weather fighter 94A, with two seats and the Allison engine; F.94C will have the Tay engine and will still be a two-seater; F.94D will have the same great engine but reverts to single-seat fighter type. Though the wings are tapered rather than swept back, this powerful fighter may compare favourably with de Havilland Venom.

At the time of writing not much is known about the McDonnell Demon, being made in quantity by McDonnell and also by the Goodyear Aircraft Corporation. Goodyear continue to be the sole suppliers of airships to the United States Navy's lighter-than-air section; but within the last few years they have also made a few amphibian flying boats; now their building resources are being applied to supplementing the production of this promising carrier fighter.

The North American F.86 Sabre flew in 1947, and in 1948 a standard F.86A complete with armament and normal combat equipment established a new world's speed record at Muroc Lake, with a speed of 670 m.p.h., with an engine of 5,200 lb. thrust, the General Electric J-47-GE-17; F.86D has the Pratt engine developed from Rolls Tay, of 6,500 lb. thrust. The new engines are equipped with "brain boxes" or electronic controls which automatically regulate the flow of fuel through the engine to bring about the best performance under any conditions. The electronic system consists of a single lever for engine control; several "sensors," devices which translate temperatures, speed, and similar information into electrical readings; and two electronic computers which digest the information. These signals then "tell the engine what to do" by regulating fuel valves to control engine speeds and control the variable discharge nozzle on the tail-pipe which regulates exhaust velocity and temperature. Another feature of F.86D is its equipment to carry 24 Mighty Mouse rockets, "enough to knock out any size of missile or aircraft flying to-day." The rockets can be fired in various combinations as selected by the pilot. When the salvo is set the pilot presses a firing-key and a launcher goes into action. In less than four-tenths of a second the rockets are on their way to the target. Rockets fired by the Sabre are the 2.75-inch Mighty Mouse solid propellant type developed by the Navy. Tail vanes fold into the body of the rockets while they are being carried, and extend to stabilise them when fired. A hit by one Mighty Mouse is enough to score a "kill" on a heavy bomber.

The main feature of F.86E is positively powered, irreversible controls, including an "all-flying" tail, and "artificial feel" and "irreversible control" systems. The entire horizontal tail surfaces of the F.86E are controllable to give the aeroplane better longitudinal control, eliminating the loss of effectiveness of the surfaces due to heavy air loads at extremely high speeds. This "all-flying tail" consists of two sections: the horizontal stabilisers and elevators which are linked for co-ordinated movement. In

conventional designs only the elevators are movable by the pilot, with the horizontal stabilisers remaining in a fixed position.

No longer using conventional power "boost" to help the pilot move ailerons and horizontal tail surfaces, these F.86E controls are powered completely by an independent source to give more positive control. Conventional boost systems usually supply a greater part of the force required to move these controls, with the pilot supplying the balance. This "difference," or pilot's share of power, gives him a "feel" of the controls. With none of the actual air loads or forces acting on the F.86E pilot's "stick," an "artificial feel" system was designed to give the pilot a representative "feel" of the control forces. A slight fraction of the control forces is synthetically "manufactured" and fed to the pilot's stick.

The "flying tail" and ailerons for the F.86E are held at given settings, as positioned by the pilot, through an "irreversible control" system. Conventional controls have a tendency to neutralise, to change position as air loads bear upon them during flight. With the new Sabre's controls powered independently, without the aid of conventional boost, this neutralising effect is eliminated.

A pressure sensing unit is incorporated in the "irreversible control" system to warn the pilot by means of the added force on his stick (which increases the "artificial feel" force), when longitudinal control is threatened by excessive air loads on the flying tail. The pilot has stable flight control forces throughout the entire flight range of the F.86E.

In February, 1952, North-American FJ-2 Fury made its first flight; it is a fast, highly manœuvrable fighter designed especially for carrier operation, but without the kneeling type nose wheel mechanism fitted to its predecessor FJ-1. Dimensions will be much the same as Sabre, but weight about 500 lb. more on account of special naval equipment.

Although, at the time of writing, North American have not themselves announced a still more powerful fighter, General Electric say of their own turbojet J73-GE-1 that it is scheduled for installation in the new North American fighter F.100. This engine must be the most powerful production turbojet in the world, with 9,000 lb. of static thrust. In due course it will be exceeded, doubtless, by the Bristol Olympus.

The Republic Thunderjet is a single-seat fighter built for the United States Air Force; it is developed from XF-84, which first flew in 1946, and which, in that year, endeavoured to break the then speed record of 616 m.p.h., falling short of that amount by only 5 m.p.h. The latest mark is 84F, the first in the series to have swept wings; it is of interest to British readers also in that it is going into large-scale production equipped with the Wright J-65 Typhoon, based on the Armstrong-Siddeley Sapphire, with 7,220 lb. of thrust. The American aircraft makers and aviation journals continue to call this engine by the British name—Wright J-65 Sapphire.

Aero Digest of September, 1951, referred to the rumour that 5,000 Republic F84F fighters were on order at that time. At one time or another 500 Thunderjets have flown across the Atlantic; and one has crossed non-stop by means of refuelling in the air. Following on experiments with this technique, Republic is replacing F.84E with F.84G, which is fitted with in-flight refuelling equipment.

The Swedish Saab 29 is a single-seat jet fighter being produced in large numbers by the Swedish Saab Aircraft Company, Svenska Aeroplan

Aktiebolaget, the initial letters of which make the trade name of Saab. It is noteworthy in that it is fitted with a British D.H. Ghost gas turbine, being built under licence in Sweden. This fighter has a thin swept-back wing, and the relatively fat fuselage provides space for all equipment, including the retractable tricycle landing gear, fuel tanks, and armament. With a top speed of about 650 m.p.h., the Saab-29 is among the world's fastest aircraft now in squadron service.

More in the class of the D.H. Vampire is the Saab-21R, twin-boom jet fighter and attack aircraft, which has now been replaced in production by the more modern Saab-29. In the 500 m.p.h. speed class, this aircraft is powered by a D.H. Goblin gas turbine: Goblin engines are in licence production in Sweden not only for the 21R but also for Vampires being built for Sweden in this country. The Saab-21R is a direct development of the Saab-21A, a sensational pusher-propelled fighter first flown in 1943, and still in Swedish Air Force service. Similar to its predecessor, the Saab-21R is armed with one 20-mm. cannon and four 13.2-mm. machine-guns.

The French firm of Avions Marcel Dassault produces a range of four fighters and two or three trainers. Their M.D.450 Ouragan (Hurricane) is a single-seat jet fighter in quantity production, powered with the Hispano-Suiza version of the Rolls Nene, with 5,000 lb. thrust; M.D.452 is a swept-wing version of M.D.450, and is styled Mysterie: though the prototype is powered by the Nene, at least one of the remaining five may have the Rolls Tay built by Hispano-Suiza, with 6,270 pounds thrust. Also based on 450, 451 is a photographic reconnaissance version, and 454 an all-weather two-seater fighter.

Sud-Ouest of Paris have produced a number of interesting jet-fighter prototypes with Hispano-Nene engines, not highly powered in relation to weight and span but stated to be capable of speeds reaching 650 m.p.h.

Nord, also of Paris, have a prototype of a ship-board interceptor fighter, Nord 2200, also with Nene; there is a variant suitable as land fighter.

The Sud-Est Mistral is interesting because it is the French version of de Havilland Vampire Mark 53 powered with a Hispano-Nene; it is capable of 574 m.p.h. at sea level.

BOMBERS

For a long time American aviation journals have been referring guardedly to a quartet of British four-jet bombers; two of them have now flown. In addition, two very much larger eight-jet bombers are ready for flight in the United States of America. But the recorded speeds of Boeing B-47 are so high that we cannot expect that any jet-bomber will greatly exceed them.

This was the first of the large bombers to have swept back wings. In 1949 a prototype flew non-stop across the United States, 2,289 miles, at 607 m.p.h. Development since that date has been in the direction of more powerful engines in differing combinations: XB-47 had four General Electric J-35 turbines of 4,000 lb. thrust; B-47A has six General Electric J-47 turbines with 5,200 lb. thrust, and in addition built-in rocket stowage to provide emergency take-off thrust of 20,000 pounds; B-47B has drop tanks; and XB-47C has four Allison J-35-A-23 turbines with a static thrust, each, of about 9,400 lb. Total thrust of this development, if this

reported figure is correct, will be about 37,600 lb., corresponding to 60,000 h.p. at 600 m.p.h. Ratio of thrust to weight is about 0.2, which is little less than the same ratio in some of the Continental jet-fighters.

The wing-surfaces are swept back 35 degrees, like those of a fighter; the crew of three sit in tandem, to make a slender fuselage, and the main wheels are also tandem. As with all modern bombers, crew accommodation is pressurised and temperature controlled. The crew are provided with ejection seats. Details of armament are not available, but on earlier models there was only a remotely controlled tail turret.

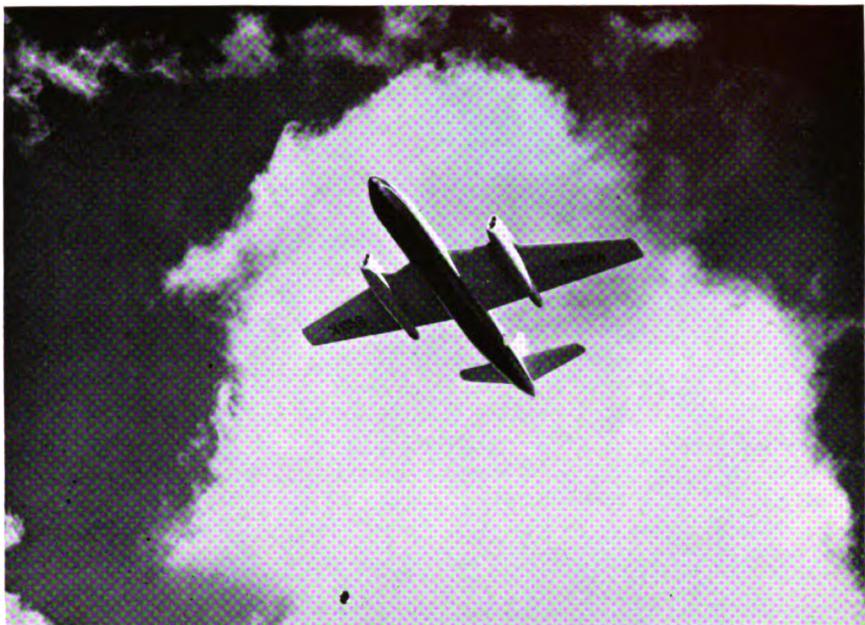
Boeing B-47 was the first aircraft to be openly styled "The Atom Bomber," meaning that its bomb-bay was long enough to take the bomb, its engine-power enough to lift it to great altitude, and its speed and ability to fly at night enough to provide a knotty problem for most of the world's jet-fighters. Since that date most of the new jet-bombers have been similarly styled, including the two British ones; and certainly they all seem to have been provided with the appropriate built-in advantages.

In Boeing XB-52, which should fly before the end of the year, the United States of America have a still more formidable atom-bomber, though not quite so graceful as B-47. It left the factory, and photographs were taken, at the end of November, 1951, and is understood to be powered with eight Pratt and Whitney turbojets styled J-57, of unstated thrust, but likely to be in the neighbourhood of 10,000 lb. each. It will be styled Stratofortress, following upon the Stratoliner of 1948, the Stratocruiser airliner, the Stratofreighter military transport, and the Stratojet B-47 medium bomber referred to above.

Speculations on the weight and range of Boeing XB-52 suggest an all-up weight of between 150 and 180 tons, and add that it is capable of delivering an atomic bomb at an extreme range of 8,000 miles; *Aero Digest* of March, 1952, on page 20 says, "Stratofortress is believed capable of sonic speed at 50,000 altitude, can fly with full load on only four engines, and includes tons of specially developed electronic equipment and advanced combat devices." If the latter include the radar computing gun-sights, an approaching fighter could be shot down while more than a mile away.

Another enormous new bomber will be the Consolidated Vultee (or Convair) YU-60. As shown in Jane's "All the World's Aircraft" just before the section devoted to United States aircraft, Y stands for the makers, Convair, and U for utility. This means that the huge aircraft may be applied to more than one purpose, like its predecessor B.36. In recent years some of the largest bombers have been converted for long range strategic reconnaissance; and the photographic version of Convair RB-36D was described on page 373 of "Brassey's Annual" for 1951. The new all-jet Convair YU-60 is a swept-wing development of B.36; it was flown in early summer, 1952. It will be powered by eight Pratt and Whitney J-57 turbojets each having a thrust of not less than 10,000 lb. As the rival Boeing is developed for 600 m.p.h. flight, it seems likely that Convair can do no less; and at this speed the eight large jets will develop a total of 145,000 h.p. In its ratio of thrust to weight this large aircraft, heavier than Bristol Brabazon, will be in the same class as many a fighter.

The development of B.36 itself, since a first flight in 1946, extends over nine prototypes: one with only two landing wheels more than 9 feet in diameter, later replaced with a caterpillar-track; another with four-wheel



Short Brothers and Harland 4-jet bomber



Vickers Valiant 4-jet bomber

bogies; a third was a project to be powered by a Pratt and Whitney compound engine which may not yet have reached production; Convair B.36D is the current production model as a strategic bomber with a crew of fifteen; RB-36D and RB-36E for photo-reconnaissance, the only difference being in the increased power of the Pratt engines; and B-36F bomber, or RB-36F for reconnaissance, both with six Pratt 3,800 h.p. piston engines, supplemented by four General Electric J-47 turbojets of 5,200 lb. thrust each. The B-36D version is the standard Strategic Air Command heavy bomber, and has more than once been seen in this country; it is used in the United States of America by four bombardment and two reconnaissance groups. B-36D has flown 12,000 miles, dropping an 84,000-lb. bomb load at some intermediate point, remaining in the air for more than 51 hours. Reconnaissance with fourteen cameras, including a 35-mm. cinecamera to record the changing shapes on the radar screen, is described in the United Aircraft Corporation's journal *The Bee-Hive* in the issue for Spring, 1950. It says that the internal space is 18,000 cubic feet, "equivalent to three five-roomed houses"; and the wing root is $7\frac{1}{2}$ feet thick, permitting easy access to the engine nacelles. The armament includes sixteen 20-mm. cannon.

Though two British four-jet bombers flew at the S.B.A.C. Display at Farnborough in September, 1951, there is, at the time of writing, a strict security screen on the more interesting details of these fine aircraft. They appear in Table III despite the fact that nothing is available in the way of dimensions; engine power is known, and in size, and doubtless weight, they correspond to Boeing B-47, say 60 tons all-up at a rough guess. Perhaps the safest way of dealing with their description is to quote, by permission, from page 401 of *Flight*, in the issue of April 4, 1952, which deals with military aircraft of the world:

The only British four-jet bombers which may be named, and briefly described, are the Vickers-Armstrongs Valiant B.1 and the Short S.A./4 prototypes, both with Rolls-Royce Avon turbojets. Perhaps the cleanest multi-engined aircraft yet built, the Valiant displays, when compared with its nearest American counterpart the Boeing B-47 Stratojet, a large wing area, and the wing roots are of sufficient chord and depth (thanks to a sharp sweeping forward of the leading edges) to accommodate the bulk of the Avons. The double-slotted flaps are in three sections and of very large area. The fuselage lines are broken only by the heavily reinforced cockpit enclosure (bespeaking heavy pressurisation) and a "blister" fairing under the nose section. Though commonly assumed to contain radar equipment, this fairing is more likely to prove to be the bomb-aimer's position for visual sighting. There is no evidence of defensive armament and the Valiant would rely for protection on its extremely high cruising altitude and speed of over 500 m.p.h. The bomb bay extends from a point in way of the wing leading edge to a station aft of the trailing edge, the rearmost bomb doors tapering in plan towards the tail.

All in all, the Valiant appears to represent a notable technical advance on all previous bombers, and it is a design, moreover, which, by virtue of its relatively low wing loading and engine space, should prove capable of lengthy development. Should it possess one defensive asset more than another, this is likely to be its high operational ceiling, even on the outward flight, before the bulk of its fuel is consumed.

The only official intimation of performance is that the Valiant is superior to the English Electric Canberra in range, capacity, speed, and altitude. The American press has mentioned operating altitudes of 50,000-55,000 feet in connection with the Valiant.

The Short S.A./4 is of more conventional, straight-wing layout than the Valiant, but unusual in that pairs of Avons are disposed well outboard, one

unit of each pair being superimposed above the other. Of exceptional capacity, the fuselage is clean-lined, though less shapely than that of the Valiant and B-47.

As part of the Air Ministry bomber policy during the past few years, Short Bros. were asked to build an aircraft which, while possessing relatively high performance characteristics, would not be unduly unorthodox in general layout. Despite the fact that the Avons turned out heavier than was estimated in the project stage, the weight increase had, due to the particular design of the aircraft, far less effect on performance than would normally have been expected. Moreover, the manner of mounting them, in addition to facilitating maintenance, resulted in an aircraft that was eminently suitable for the speedy installation of later turbojets and one in which, by reason of the unobstructed air intakes and short tail-pipes, high engine efficiency was secured.

The Short Brothers and Harland S.A./4 was designed to accommodate the Air Staff bomber requirements in the matter of radar, radio, and similar installations and embodies very advanced ideas in anti-icing, claimed by Short Brothers to be present in very few aircraft to-day. Thus, the Ministry of Supply now have at their disposal a modern type of jet bomber on which to experiment with new weapons and equipment.

North American B-45 Tornado, a four-jet light bomber, exists also as a tactical support bomber, perhaps the first instance of four-jets being applied to tactics; the photographic version has not developed further, and was described on page 375 of "Brassey" for 1951. Fourteen B-45A were modified to become high-speed target-towers for use with the Chance-Vought 20-feet-span all-metal target glider.

Sud-Ouest of Paris have produced an experimental light bomber, S.O.4000; it is powered by two Hispano-Nene turbines. Seats and wheels are in tandem, making for a slender fuselage. The two engines are in the rear part of the fuselage, side by side; 514 m.p.h. has been stated as an estimated cruising speed.

English Electric Canberra now exists in several variants: B. Mark 1, the first four medium bombers, with solid nose; B. Mark 2 has a transparent nose and wing-tip tanks, and is the type being made not only by English Electric but by Avro, Handley Page, Short Brothers and Harland, and the Government factory at Fishermen's Bend, Australia. Then there is P.R. Mark 3 for photo-reconnaissance. All except an experimental Mark 1 have two Rolls-Royce Avon engines.

The Canberra being made by Glenn Martin of Baltimore is a night intruder styled B-57A. Its speed is stated as 600 m.p.h. and range as 3,000 miles. The engines are larger than the Rolls-Avon, being Wright J65-W-1, each capable of 7,220 lb. of static thrust; these are the Wright version of the Armstrong-Siddeley Sapphire.

The Glenn Martin Model 234, built for the U.S.A.F. as XB-51, is being prepared as a production prototype. It is a three-jet light bomber, with two engines in external nacelles mounted on short pylons just beneath the wing roots, and the third internally at the after end of the fuselage. Speed of this experimental light bomber has not been disclosed, but span and weight are smaller than Canberra, and the thrust of the three engines is no less than that of the two Avons.

FLYING-BOATS

In the development of flying-boats for military use little or no progress was made on this side of the Atlantic during the period under review; but following on the first flights of the Consolidated Vultee 60-ton

anti-submarine XP5Y-1, the makers say "The United States now holds world leadership in the development of water-based aircraft—a leadership important to our national preparedness programme, a matter of more than pride."

There has been no lack of British expert advice in regard to the future of the flying-boat; and it has been a record year for the number of authoritative pronouncements on this subject.

The previous year closed with a lecture at the Royal United Service Institution, by Air Vice-Marshal Mackworth, in which he stated the advantages of the flying-boat for anti-submarine work: great flexibility, requiring no airport construction; the ability to move to the other side of the world at short notice; long endurance; comfort for crew; space for considerable electronic equipment.

In June, 1951, Mr. Henry Knowler, Chief Designer of Saunders-Roe, addressed the American Society of Mechanical Engineers; and in March, 1952, gave the Louis Bleriot lecture in Paris. Both lectures looked far into the future*:

The big long-range flying-boat need not suffer from preconceived disadvantages such as high drag and weight; on the other hand, it met the needs of the passenger of the future, who would demand increased comfort as well as reduced journey time. The Princess, it was considered, fitted well into the picture, having speed, comfort and independence of airfield development, as well as the capability of low operating cost. Due to its size, it would be in a position to meet an increasing traffic potential, and obtain a fair share of the latter. The prestige associated with the big flying-boat would ensure high load factors in a highly competitive market.

Discussing maintenance and docking, the lecturer said that the tradition that flying-boats should lie at moorings for re-fuelling, inter-flight maintenance and loading, dies hard. His own views on types of base facilities were summarised as follows: (i) Maintenance base. All major overhaul work should be done at this base; therefore, it would have a slipway, hard-standing, hangars and stores. It would also have a number of permanent pontoon docks with all necessary supplies piped from the shore. (ii) Operating bases. All regular operating or refuelling points would be provided with a number of portable pontoon docks, having causeways to the shore carrying piped supply-lines for refuelling, electrical supplies and so on. They would, however, carry emergency equipment for engine changing. (iii) Temporary refuelling bases. These would be similar to the operating bases but would be equipped with a single portable pontoon dock. The dock would be used with either a floating causeway to the shore, where this was possible, with land-based refuelling storage and equipment, or from a barge moored nearby. (iv) Emergency bases. These would be used infrequently and need not be equipped with more than fuel storage and means of supply. The aircraft would lie to a mooring buoy and be tendered by a local launch. Fuel would be pumped from a small lighter.

Of ocean patrol flying-boats Mr. Knowler said that no doubt new methods of submarine detection would be developed in the near future, in addition to radar and sonobuoy location. For example, it had been suggested that such flying-boats should alight at sea, lying to a sea anchor, while sub-surface methods of detection were employed. This brought into prominence the high sea-worthiness which could be provided in future machines of this type. A hypothetical design considered would weigh about 150,000 lb. and cruise at 400 m.p.h. for a gross range of 8,000 miles.

In looking to the future employment of flying-boats their use in the role of bombers and mine-layers should receive careful consideration. The problem of carrying bombs had been solved in a number of existing aircraft and new methods had been projected.

*With acknowledgment to *Flight*, "the flying boat paper", July 6, 1951, and March 14, 1952.

Mr. G. E. Stout, Assistant to the Chief Engineer of Consolidated Vultee Aircraft Corporation, delivered a paper at the Third Anglo-American Conference, entitled "A Review of High-Speed Hydro-dynamic Developments." It was remarkable for two reasons :

- (i) Full description of the use of a one-tenth scale dynamically similar radio-controlled model of the proposed XP5Y-1, now flying ; 2,000 test runs were made with the model.
- (ii) The development of a retractable spray-dam which deflects the spray downwards, with little or no rebound or reflection.

An editorial in *Flight* of February 22, 1952, sums up some of the points of the Brancker Memorial Lecture delivered to the Institute of Transport by Air Chief Marshal Sir Frederick Bowhill, Chief Aeronautical Adviser to the Ministry of Civil Aviation :

There is the fear that expert flying-boat design-teams in the British aircraft industry are fast being dispersed, and the art lost ; there is the trend towards larger transports for trunk routes—and it is, of course, in the large sizes that the flying-boat shows its most marked advantages over the land plane ; and there is the almost prohibitive effort and cost now entailed in obtaining the land and constructing and maintaining the vast areas of concrete comprising a modern airport. Other factors not to be passed over lightly are the inflexibility of the operational pattern open to large, long-range landplanes, especially in war ; the vulnerability of such runways as do exist ; the serious loss of valuable agricultural land in the British Isles and elsewhere, and—something new, perhaps—the growing opposition of the public to airports, with their noise and possible danger, in built-up areas. A high percentage of all airline accidents occur on take-off or landing.

Much of the lecture dealt with mail, cargo, and passenger applications of flying-boats ; and here the question of economics might be paramount. Sir Frederick said that "he could not do better than refer to those very able lectures, one by Peter Masefield, given before the Institute of the Aeronautical Sciences in New York on January 30, 1947, and the other by D. Keith-Lucas, of Short Brothers and Harland, Ltd., given before the Anglo-American Aeronautical Congress in New York on May 26, 1949." But in his trenchant closing phrases the lecturer gave a stern warning to anyone who might be charged with indecision, or delay, or decision without due regard to the signs of the times :

In peace, we had to prepare for war. In preparing for war, transport was a vital factor, and to have an air vehicle which need not depend on runways or strips, but which could use the sea, rivers or estuaries, would, in certain cases of enemy activity, be of the greatest value. Because of this alone, a proportion of our air transport should most certainly be flying-boats.

Another great war factor—and this applied also to a certain extent in peace—was the ability to produce aircraft quickly and, therefore, surely we should keep alive and in being every firm which had mastered the art of building aircraft. There were only two firms in the United Kingdom which had mastered that art, so far as flying-boats were concerned : Short Brothers & Harland, Limited, (which, alas, with the exception of the Sealand, was no longer building flying-boats), and Saunders Roe, Ltd.

Sir Frederick concluded his lecture with the statement that, in his opinion, we were going full speed ahead to "kill" the flying-boat. This was a tragedy, and he could foresee that, in a few years' time, when the art had been lost, and when the teams of flying-boat designers had been scattered to the four winds, the nation would wake up to the need for them.

During the period under review a book was published dealing with the history and development of flying-boats: "Wings for To-morrow," by John Taylor and Maurice Allward, published by Ian Allan Ltd. Referring to this book, Sir Frederick Bowhill said:

It had been asked, Why, if the flying-boat had a future, was it not included in the various classes which were the outcome of the Brabazon Committee Report? The answer to this question was given by Lord Brabazon himself, in his preface to that excellent book, "Wings for To-morrow," where he says: "Speaking on behalf of the great Brabazon Committee, I have always felt a little guilty that we did not see our way to recommend the building of new 'boats.' I have also been surprised, considering the popularity of flying-boats, that the Committee was not vigorously attacked for its sins of omission. The facts are, however, that we did all we could, but our terms of reference were to express 'users' requirements' as to future types, and at the time we could not get those in charge of the operation of fleets of aircraft to demand them. I thought then it was a mistake; I am sure of it now."

It seems likely that no long-range flying-boat of the future would depend upon piston-engines alone: Convair XP5Y-1 has turboprops, like Saunders-Roe Princess; the Saunders-Roe project styled "Duchess" would have turbojets, like their single-seat fighter flying-boat SR/A.1; an ideal engine for long-range operation would be the Napier Nomad, compounding a diesel engine with a geared turbine; and Mr. Knowler, in his lecture, goes far beyond any of these; and says of an atomic-power installation:

The weight of reactor unit, controls and screening would be high; this part of the installation took the place of the fuel load in the conventional aircraft. A very approximate approach to the aircraft weight indicated that for structure, engines, take-off assistance and useful load, roughly 60 per cent. of the total weight would be required. Therefore, for a reactor unit weighing, say, 100 tons, an aircraft of from 500,000 lb. to 600,000 lb. weight would be necessary. This was a very big aircraft to contemplate as a landplane but as a flying-boat such a size would be acceptable without query.

About the time that Mr. Knowler's paper was delivered, Consolidated Vultee (Convair for short) were joyfully announcing that they had been entrusted with some of the development work in connection with atomic propulsion of aircraft. Mr. Stout of Convair showed a remarkable illustration of a flying-boat with delta-wings, like their 60-degree delta interceptor XB-46, and referred to its supersonic blended hull, but did not deal with future (or rather, futuristic) methods of propulsion.

A little further information has become available in regard to the new American flying-boats. The Convair prototype XP5Y-1 is powered by four XT40 Allison gas turbine engines of 5,500 h.p. each, a total of 22,000 h.p. The turbine engines drive six-bladed Aeroproducts contra-rotating dual propellers, with some of the power output utilised as thrust in the manner of straight jet propulsion. The propellers are reversible for ease in manoeuvring on the water.

It is designed for long-range search-rescue, overseas transport, and combat assignments as well as anti-submarine missions. It can carry bombs, torpedoes, mines, rockets, and other weapons. Defensive armament includes four side turrets and a tail turret with 20-mm. cannon. Other equipment includes the latest radar, search and radar-counter-measure gear, in addition to anti-submarine equipment. A central pressure refuelling system permits refuelling in a matter of minutes from

barge or other surface vessel. Special attention was devoted to comfort of the crew, who may be required to live aboard for weeks at a time on extended operations. Other XP5Y-1 features include high-and-low-pressure pneumatic systems; and gas turbine compressors of new design and light weight, which provide ample auxiliary power for engine starting and non-flying requirements.

The company has received from the United States Navy an initial order for an undisclosed number of these turboprop seaplanes in a long-range, high-altitude cargo-transport version to be known as the R3Y.

The Glenn Martin Marlin is designed specially for the detection and destruction of enemy submarines. Its radar equipment makes possible the detection of even a schnorkel-equipped submarine (one which "breathes" through a tube projecting a short distance above the water). Once a submarine is detected, the Marlin can destroy the raider by means of its own armament, or can guide surface or other craft to the kill.

The long afterbody makes for better landing and take-off characteristics, especially on rough water. It also practically eliminates the "step," a sharp upward break in the keel about halfway back on older seaplanes.

Added manœuvrability for the Marlin was achieved by the installation of a pair of "hydroflaps," underwater rudders on each side of the hull near the tail. These hydroflaps are operated hydraulically by the pilot from the cockpit. Used separately, they act as rudders, taking the place of dragging sea anchors or revved-up engines formerly used in steering in water, especially when attempt was being made to attach to a buoy. Used together, the flaps act as brakes. The Marlin with hydroflaps has proved easier to manœuvre than conventional seaplanes with less hull under the water.

While the primary purpose of the Marlin will be for anti-submarine warfare in any part of the world, it may also serve the Navy as a cargo or general utility carrier. It carries a crew of seven.

The largest amphibian built by Grumman is now in production and being delivered to the United States Air Force and Navy, and Coast Guard. It has the distinction of being the first aircraft to be adopted to the unified Naval-Air Force commands; from the same production line aircraft are delivered to both services.

The Albatross was developed by the Navy as a general utility aircraft capable of performing such duties as a hospital plane, air-sea rescue operations, cargo operation, high-speed amphibious transport, and photographic reconnaissance. It has been adopted as the United States Air Forces standard air-sea rescue amphibian to be based from Alaska to Arabia.

With a wing span of 80 feet and a length of 61 feet, the Albatross, as a hospital ship, can accommodate twelve litter patients in addition to a crew of six. As a rescue craft, seating accommodation can be re-arranged according to the nature of the mission.

The Albatross is powered by two Wright R-1820 engines of 1,425 h.p. each. It has a top speed of 270 m.p.h., and a cruising speed of 225 m.p.h. It is equipped with 11-foot diameter Hamilton-Standard reverse pitch propellers to facilitate landings in small fields and on lakes.

There is little to add to Table V on page 395 of the 1951 "Brassey." The Saunders-Roe Princess has emerged from the hangar to have its outer wings fitted. It will weigh about 140 tons gross; the other giant boat,

the largest aircraft in the world, weighs about 180 tons gross. It is the Hughes flying-boat, which will carry 700 persons; but it has not flown since November, 1947, and is understood to be undergoing reconstruction.

There are three Princesses under construction, originally ordered by British Overseas Airways Corporation, who later decided that the fleet should consist only of landplanes. But the Ministry of Supply wisely decided that development should proceed; and these large aircraft might be used by the Royal Air Force, or the Navy, as transports, corresponding to similar recent applications of the Martin Mars.

MILITARY TRANSPORTS

Though there have been no striking developments in the design of the types of aircraft listed in Table IV, military experience and experiment are leading to the production of two main types of transports:

- (i) Long-range, high-speed transports, with powerful engines, a heavy weight of fuel, complex load-handling equipment, and a high wing-loading.
- (ii) Medium-range transports, sometimes developed from large gliders, with low wing-loading, and which are therefore able to land on, or take-off from makeshift aerodromes.

There will always be full use for both types; but the wide range of applications overlaps: both are suitable for transport of fully armed troops or paratroopers; wounded and their medical attendants; heavy equipment such as tanks, guns, and trucks; light stores or paracans; engineering materials for bridges or railways; fuel, either for forward supply or refuelling in flight; and certain specialised applications such as a mobile Command Headquarters, a complete radio station, or a water-purification equipment.

The most striking development in the medium-range supply aircraft is the detachable pannier or pod of the Fairchild packplane, capable of a nine-ton payload. The pods move on their own wheels, and can be detached from the aircraft, wheeled away, and replaced by others in a few minutes. Such an aircraft could bring in supplies or fresh troops, and in five minutes take off with a full load of wounded and their attendants. The pods of supplies could be set down close to the front line by large helicopters, some of which, with pods of their own, are already available; the same helicopter could bring wounded down to an aerodrome in comfort and safety instead of their having to undergo a toilsome journey by bullock-cart or field-ambulance.

Typical of the long-range hospital ship is the Boeing KC-97E Stratofreighter, 73 tons in weight, pressurised to ensure that wounds would not be aggravated by high-altitude flight. By every bed there is an oxygen point, and a plug for an electric blanket for the treatment of shock. It can carry 79 patients on stretchers, with medical attendants and full supplies; and it cruises at 300 m.p.h.

This aircraft can be converted to the role of flying tanker for refuelling in flight; and can also be applied to transport of heavy freight. For refuelling, the clam-shell cargo-loading doors are removed to accommodate a pod for the refuelling-boom operator, and the base of the boom itself. The basic fixtures are permanent in the aircraft but do not take up useful cargo

space. Where ambulance-aircraft have two decks, like this Boeing and Convair XC-99, the lower could be used as an operating theatre.

Perhaps this quick trip home for wounded is the most useful feature of high-speed military transports; but for the carriage of tanks, guns, or trucks they usually have ramps, hydraulically or electrically lifted and lowered, and large clam-shell doors. Breguet Provence, which also has two decks, has a removable after part for the upper deck, so that large tanks or guns can be loaded.

Electrical hoists, usually worked in conjunction with a monorail running the full length of the cargo space, facilitate loading and unloading. They can also be applied to supply dropping, used in conjunction with electrically removable panels which can be operated in flight. The Bristol Freighter has a roller-conveyor in the floor for the same purpose. Convair XC-99 has two electrically operated cargo-hatches for supply dropping, and no less than four cargo-hoists on overhead rollers. It has forward and rear vehicle-loading ramps, and will carry 400 fully-armed troops or 300 sick with their medical attendants.

Such highly equipped long-range transports include, in order of size, Convair XC-99, Douglas C-124B, Boeing C-97, Breguet Provence, Lockheed Constellation, and Handley-Page Hastings. The Lockheed has a detachable pannier or "Speed-Pak" fitting the contour of the hull and carrying about 4 tons, or 400 cubic feet, of supplies.

The "Fairchild Idea," of separating the load from its prime mover, is the greatest advance in medium range military transport since the war; working with helicopters, the pods can be put down close to the line, and wounded brought back, with an efficiency not likely to be bettered for many years.

The next most important advance is the development of aircraft which can land on small aerodromes close to the line, deliver their loads and collect fresh ones, and take off again. The process is expedited by the use of prepacked containers; but no container could be loaded or unloaded quite so quickly as the pod. The aircraft which are best fitted for this duty are, in order of size, Blackburn and General Universal Freighter, Fairchild Packplane, Chase Avitruc, Bristol Freighter, and Nord Nor-Atlas; they have in common the desirable feature of low wing-loading, with probably low landing speed and short take-off run. Chase Avitruc has been fitted with four jet engines, and is said to take off in only 600 feet. Rocket-assisted take-off is practicable with these medium-range transports; this is better than increased engine-power, unless the engines and fuel are lighter, as heavier engines increase the wing-loading. Most of them have been developed from gliders, and still have the tail and rudder surfaces on booms; this would permit the application to them of the Fairchild Idea, should the size of the helicopters in the future make front supply with pods militarily possible.

HELICOPTERS

At least two types of helicopter will be able to lift pods of various weights: the Piasecki 40-seater, and the Hughes experimental model, driven by a pair of gas-turbines and reputed to be able to lift ten tons. At the time of writing no flights of either have been reported, and little or nothing is known of the Hughes helicopter. The Piasecki XH-16, however, has been



Carrier Operations over Korea. **Rescue Helicopter, the last to land at sunset on board H.M.A.S. Sydney**

(Official photograph by permission of the Admiralty)

specially designed for military work, chiefly long-range rescue and troop transport when without its capsule or pod ; with the pod the main body of the helicopter is mounted on tall landing-legs, with the pod slung between them ; as with the Fairchild pods, it is a matter of minutes to lower and wheel away the incoming pod ; and a similar brief time to couple up a loaded or empty outgoing pod.

Like the Hughes flying-boat, the Hughes helicopter will be by far the biggest in the world ; but it may have a long period of development and testing, and seems to consist at present only of the engines and rotor mounted on a test stand. Piasecki XH-16 is the next largest, though its forty fully equipped troops might have to be closely compacted ; the next biggest will be the Saunders-Roe-Cierva W.11.T, a larger version of their Air Horse ; and then the Air Horse itself, frequently seen at the S.B.A.C. Display at Farnborough, which would seat up to twenty-four passengers, in addition to pilot and co-pilot.

For some time Sikorsky have been building their production models of S-55, a twelve-seat utility helicopter which has the distinction of being ordered by the United States Air Force, the Navy, and the Marine Corps. Westland Aircraft Limited at Yeovil are undertaking production in this country ; their Sikorsky 51 has been used for a wide range of duties, including the delivery of supplies to a weatherbound lighthouse and landing on the deck of a naval auxiliary vessel.

The Bristol Type 171 provides total accommodation for four persons, including one or two pilots ; but Britain's first twin-engined, twin-rotor helicopter, Bristol Type 173, is designed as a thirteen-seater, with a variety of military uses. Type 171 has been built as an ambulance, with external panniers for two patients.

The range of applications of helicopters is constantly being extended, and in its issue of February 22, 1952, *Flight* reported some exercises by the United States Marine Corps School designed to prove that troops could be landed in strength on hostile territory by means of "triphibious" helicopters : although this phrase originally meant that a helicopter, with the air as its natural element, could land at sea on a carrier, or smaller vessel, and could disembark troops on any type of terrain, Piasecki are building helicopters which will land on water. This is a development of Piasecki H.21, originally built for the United States Navy as an Arctic Rescue Helicopter able to land on snow, ice, marsh, tundra, water, carrier-deck, concrete, or grass-land ; H.21B is specially designed as an assault-transport helicopter, with twenty-two seats and a single engine of 1,425 h.p. The large hull has fittings for seating or cargo, and one of the two entrance and exit doors is fitted with a hoist that will lift 400 lb.

In the exercises it was found that launching could be carried out while all the ships were under way ; landings need not be made on the beaches but could take place at any distance inland under cover of ground support aircraft. Gun crews were landed in advance of their guns, to direct the pilot to the best site ; the helicopters could continue to fly back and forth between carriers and the land, evacuating wounded on one journey and bringing supplies on the other.

Westland Aircraft Limited are at present engaged on designs or projects for three large helicopters, one for thirty troops ; two Mambas or Darts would drive the rotors. The largest might carry about one hundred men ;

but an impressive load would be three guns, and three jeeps, and about fifteen men.

On November 23, 1951, Mr. O. L. L. Fitzwilliams, B.A., read a paper before the Helicopter Association of Great Britain entitled "The Giant Helicopter." He referred to a proposed design for 102 troops, and a much larger one for a maximum of 400 men; alternatively, it would lift one 45-ton tank or three 15-ton tanks; or six 25-pdr. guns, 600 rounds of ammunition, and gun crews, with a still air range of 280 miles. The paper was published in full in *Flight* of November 30 and December 7, 1951.

The usual type of helicopter is not very fast, and for some time there have been proposals and designs directed towards increased speed. The most likely solution is the "convertible" or "convertaplane," mentioned, for the first time in Jane, in the Preface to "All the World's Aircraft" for 1951-52:

The first experimental contracts for the construction of three "convertaplanes," each of a different configuration, have been placed with the Bell, McDonnell, and Sikorsky organisations, under a joint United States Army and Air Force development programme. These aircraft combine the advantages of vertical lift and hovering flight of the helicopter with those of relatively high-speed level flight of a normal aeroplane.

The Helicopter Association of Great Britain has a paper on "Convertible Aircraft" in its Journal for July to September, 1951, Volume 5, Number 2.

AEROPLANES FOR TO-MORROW

It begins to look as though to-morrow's interceptors will in general be of delta shape, and five great firms have pinned their faith to prototypes—Convair, Avro, Boulton Paul, Douglas, and Fairey. The final versions of all these will be without tails. Mr. J. R. Ewans, Avro's Chief Aerodynamicist, made a statement in 1951 which was published in *Flight* of August 10, in which he said that the delta wing was the only satisfactory solution to the problems posed by the compressibility of the air at or near the speed of sound: the delta wing is highly swept back, the wing can be made very thin, the wing loading is low, and the aspect ratio is low. The wing is stiff and free from some of the distortion troubles which may appear in large swept-wing aircraft; flaps, nose-flaps and slots, and the all-moving tail are eliminated. The wing is thick *at the root*, and blends into the hull, thus permitting engines, tanks, and undercarriage to be buried at the root-chord, which extends for a good proportion of the total length of the hull.

Of the five delta aircraft mentioned, Convair (or Consolidated Vultee) XF-92 had a small fixed tailplane for its first flights, and the others have been designed without any. Span is about 33 feet for all except the Fairey FD-1, which has a span of only 19 feet. Housings for rocket take-off have been fitted to FD-1, which, in common with others, has a landing parachute or drogue; this aircraft also has parachutes for anti-spin purposes.

To overcome some of the difficulties, with very high-speed aircraft, of landing and take-off, the Bell Aircraft Corporation at Niagara Falls has designed Bell X-5, in which the sweep-back of the wings can be varied in flight. The problem has been attacked from a different angle in the Republic experimental interceptor XF-91, which has wings with variable incidence and wider at the tip than they are at the root. The variable incidence permits a high angle of attack for take-off and landing, and a razor-edge for high-speed flight. The aircraft firm of Rey, at Boulogne, also has a variable-incidence wing being tested in flight on their Rey R-1.

A transformable delta project, a proposal made by Professor G. T. R. Hill, is described in *Flight* of July 27, 1951; it is under consideration by Blackburn and General Aircraft Limited. At high speed the wing-plan is that of a true delta; for take-off and landing part of the leading edge of the delta swings out and forward to provide a wing, with conventional aileron, at right angles to the hull. Ballast-tanks are necessary to compensate for the change of trim.

Another interesting patent of the year has been the design of Rolls-Royce for an engine intake which looks like a mouth-organ; its most important feature is that, when used as a leading edge, it is structurally thick but aerodynamically thin, since the drag is due only to the thin top and bottom skins and the supporting vertical subdivisions.

The United States journal *Aero Digest*, in its number for September, 1951, has an article on the work of the National Advisory Committee for Aeronautics (N.A.C.A.) at its Langley Aeronautical Laboratory; and listed some interesting aircraft as being under high-speed tests: Douglas D-558-2, the world's fastest aircraft, said to have exceeded 1,200 m.p.h. at 63,000 feet; and the Bell X-1, which, in October, 1947, also exceeded the speed of sound. The Bell X-1 has rocket propulsion only, but Douglas D-558-2 is provided also with a turbojet. Either of these aircraft will burn a ton a minute of rocket propulsive. Both are carried to altitude by a mother-ship, and dropped as their own propulsive rockets ignite; one, two, three, or four rockets can be burned at once; and, with only one rocket burning at a time, maximum duration of propelled flight might be as much as ten minutes.

Other aircraft for to-morrow, designed for supersonic speed in level flight, include Douglas X-3, still in the project stage, engined by ramjet or pulse-jet; Bell X-2, with a Curtiss rocket engine which can be throttled; and possibly the Leduc two-seater ramplane, which has flown.

BRITISH GUIDED MISSILES

For some years, makers of guided missiles in United States have made no secret of the excellence of their products; but in this country there has been little or no official mention of the fact that similar weapons have been and are being produced by British manufacturers. *Flight* of August 1, 1952, on page 138, had an article on British Guided Missiles, showing a guided rocket being launched at Aberporth, Cardiganshire, in the presence of the Minister of Supply and the Secretary of State for Air.

The Minister said that "guided rockets have been developed which can travel at well over 2,000 miles an hour and can rise to heights far greater than any bomber is likely to reach for years to come. They can be steered, or better still can steer themselves, with great accuracy, and can twist and turn with four or five times the manœuvrability of a fighter aircraft."

Rockets are being produced by Bristol, de Havilland, English Electric, Fairey and the Hawker Group; for some time, advertisements have been appearing in *Flight* and *The Aeroplane* for guided-missile technicians, under the names of these and other firms, including also Short Brothers and Harland of Belfast.

G. W. WILLIAMSON

TABLE I
SOME TWIN-JET FIGHTERS

Maker and Type	Span, ft. in.	Gross weight, lb.	Static thrust, lb.	H.P. at 600 m.p.h.	Thrust Weight Ratio
de Havilland D.N.110 ..	—	—	13,000	21,000	—
Gloster Meteor N.F.11 ..	27	19,000	14,400	23,000	0.76
„ G.A.5 ..	—	—	13,000	21,000	—
Supermarine 508 ..	41	—	14,400	23,000	—
Avro (Canada) Canuck ..	52	—	13,000	21,000	—
Sud Est Grognard ..	—	39,600	6,000	9,600	0.15
Chance-Vought Cutlass ..	38	23,300	6,000	9,600	0.26
Douglas Skyknight ..	50	27,000	9,600	15,300	0.35
„ XA3D-1 ..	—	67,000	15,000	24,000	0.22
Lockheed XF.90 ..	40	26,000	6,000	9,600	0.23
McDonnell Voodoo ..	39 8	15,000	6,000	9,600	0.40
Northrop Scorpion ..	56	30,000	10,000	16,000	0.33

TABLE II
SOME SINGLE-JET FIGHTERS

de Havilland Venom ..	41 9	12,000	5,000	8,000	0.41
Hawker Hunter ..	33 8	—	6,500	10,400	—
Supermarine Swift ..	31 9	—	6,500	10,400	—
Douglas Skyray ..	24	16,000	7,500	12,000	0.47
Grumman Cougar ..	—	—	—	—	—
„ Panther ..	38	17,000	6,200	9,900	0.36
Lockheed F.94C ..	39	15,330	6,500	10,000	0.41
McDonnell Demon ..	—	—	7,500	12,000	—
North American Sabre ..	37	18,000	5,200	8,300	0.29
Republic Thunderjet ..	33	25,000	7,200	11,500	0.3
MiG.15	32 6	12,000	5,500	8,800	0.46

TABLE III
BOMBERS, ALL-JET OR JET-ASSISTED, IN ORDER OF SIZE

Maker and Type	Span, ft.	Weight, tons	E.H.P.*	Remarks
Convair YU-60 ..	—	180	117,000	8-jet
„ B.36 ..	230	163	53,000	Maximum range, 10,000 miles. Maximum load 42 tons.
Boeing XB.52 ..	—	150	117,000	8-jet.
Northrop YB.49 ..	172	105	64,000	The "All-Wing" aircraft.
Boeing XB.47C ..	116	82	55,000	Speed 600+.
Short Bros. S.A.4 ..	—	—	38,000	
Vickers Valiant ..	—	—	38,000	
Consolidated Vultee XB.46 ..	113	45	32,000	Speed 500+.
North American R.B45C ..	90	50	32,000	Speed 550+. Range 1,200 m.
English Electric Canberra ..	64	20	21,000	Speed 555. Range 1,500 m.
Sud-Ouest 4000 ..	58	20	14,700	
Martin XB.51 ..	55	7	15,000	Maximum speed, 600 m.p.h.

* E.H.P. is the Equivalent Horse-power at 550 m.p.h.

TABLE IV
MILITARY TRANSPORTS

Maker and Type	Span, ft.	Weight, tons	H.P.	Maximum Load and Maximum * Range
Consolidated Vultee Convair XC.99 ..	230	132	21,000	50 tons; 8,000 m.
Douglas C.124.B ..	173	87	22,000	25 tons; 6,280 m.
Boeing C.97.A ..	141	73	14,000	34 tons; 3,750 m.
Blackburn and General Universal Transport ..	162	47	7,000	14 tons; 1,750 m.
Lockheed Constellation ..	123	47	10,000	22 tons; 5,500 m.
Handley Page Hastings ..	113	36	6,700	9 tons; 3,886 m.
Fairchild XC.120 ..	109	36	6,500	9 tons; 1,150 m.
Chase XC.123 ..	110	35	4,800	14 tons; 5,060 m.
Bristol Freighter ..	108	19	4,000	5 tons; 1,680 m.
Nord Nor-atlas ..	106	16	4,000	5 tons; 1,000 m.
Vickers Valetta ..	89	16	4,000	5 tons; 1,410 m.

* Maximum range is stated for a military load much less than the maximum.

TABLE V
FLYING BOATS

Maker	Mk. or Number	Weight (tons)	Speed (max.)	Range	Total H.P.
Saunders-Roe	Princess (under construction)	140	380	5,500	35,000
Saunders-Roe	S.R. A.1, jet fighter, single-seater	6.5	—	—	11,000
Short ..	Sunderland	27	213	2,690	4,800
Short ..	Solent	35	276	2,200	8,160
Short ..	Sealand (t/e amphib.)	4	189	425	850
Convair ..	XP.5.Y.1, long range, patrol	60	250	10,000	22,000
Grumman ..	Albatross amphibian	12	270	1,400	2,850
Grumman ..	Mallard	56	215	1,380	1,200
Martin ..	Marlin P.5.M.1	—	—	—	6,000
Martin ..	Mars	65	222	—	12,000
Nord ..	Noroit	—	230	2,610	2,400

TABLE VI
HELICOPTERS

Maker	Name	Seats	H.P.	Total Wt.
Bristol	Type 173	15	1,100	10,600
Bristol	Type 171, M.3	4/5	550	5,200
Cierva (Saunders-Roe) ..	W.11, Air Horse	24	1,620	17,500
Fairey	Gyrodyne	4/5	525	4,800
Westland	S.51, Dragonfly	4	500	5,700
Breguet	Gyroplane	4	450	2,100
Bell	Model 48	5/8	550	6,286
Gyrodyne	GCA, Model 2	5	450	5,400
Piasecki	PV3, Rescuer	2/8	600	6,900
Sikorsky	S.55	12	600	6,800
Sikorsky	S.52	3/4	245	2,400
Sikorsky	S.51	4	450	5,500

TABLE VII
SOME LARGE PROPELLER TURBINES

Maker and Type	Shaft horse-power	Thrust, lb.	E.H.P.*	Weight, lb.	Pounds per E.H.P.
ARMSTRONG					
Mamba II	1,280	384	1,654	780	0.45
Double Mamba	2,540	770	3,310	2,000	0.60
Python	3,670	1,150	4,820	3,150	0.65
BRISTOL					
Theseus	2,220	825	3,045	2,205	0.73
Proteus	3,200	800	4,000	2,900	0.72
Coupled Proteus ..	6,400	1,600	8,000	8,106	1.00
NAPIER					
Naiad	1,500	241	1,741	1,100	0.65
Double Naiad	2,970	482	3,452	2,200	0.65
ROLLS					
Clyde	3,500	1,200	4,700	2,500	0.55
Dart	1,400	310	1,710	850	0.50
ALLISON					
T38	—	—	2,750	1,225	0.45
T40	—	—	5,500	3,000	0.55
PRATT AND WHITNEY					
T34-P-2	6,000	600	6,600	2,550	0.40

* E.H.P. is Total Equivalent Horse-power at 375 m.p.h.

TABLE VIII
LARGE ALL-JET TURBINES

Name and Type	Thrust, lb.	E.H.P.*	Weight, lb.	Pounds per E.H.P.
ARMSTRONG				
Sapphire	7,200	12,500	2,500	0.20
ROLLS-ROYCE				
Avon	6,500	11,300	2,400	0.21
Tay	6,500	11,300	2,000	0.18
Nene	5,000	8,700	1,550	0.18
DE HAVILLAND				
Ghost	5,000	8,700	2,011	0.23
AVRO (CANADA)				
Orenda	6,500	11,300	2,900	0.25
ALLISON (U.S.A.)				
J.33 (Model 400)	4,600	8,000	1,795	0.23
J.35 (Model 450)	5,000	8,700	2,260	0.28
J.71-A-1	9,800	17,000	3,650	0.22
GENERAL ELECTRIC (U.S.A.)				
J.47	5,200	8,700	2,500	0.29
J.73	9,000	—	—	—
PRATT AND WHITNEY (U.S.A.)				
Turbo-Wasp, J.42 (Nene)	5,000	8,700	1,723	0.20
J.48 (Tay)	6,500	11,300	2,000	0.17
WESTINGHOUSE (U.S.A.)				
J.40-WE-2	7,500	—	—	—
WRIGHT (U.S.A.)				
Typhoon YJ-65 (Sapphire)	7,220	12,500	2,500	0.20

* E.H.P. is Equivalent Horse-power at 650 m.p.h.

CHAPTER XXIX

TACTICAL AIR FORCES

TACTICAL AIR forces have now persisted for nearly forty years. In the face of repeated declarations that air power is indivisible, the idea of a special kind of air power for application to land battles retains its hold. Notions as to how it should be applied have changed under the pressure of experience gained in two big wars. The apparatus has been developed and control techniques have advanced. Tactical air power is no longer split up into small packets and attached to divisions or armies. It has acquired sufficient freedom to translate Army requests into its own terms and prescribe the ensuing response. It is able at last to fulfil the sound military principle of concentrating the maximum force on the decisive task. Yet, in the sense that it remains concerned primarily with armies and land battles, the tactical air force tends more to be the servant of armies than the wielder of military power in a new element. It can be said to be the victim of its own limitations. The greatest of these is range. So long as fighter bases have to be close to the enemy, the army which protects them must be given support, for that reason if for no other. So long, too, as a potential enemy like Russia depends on massive armies covered by an immense tactical air power, the army and air mixture to oppose invasion and occupation is unavoidable.

There can be no wonder in these circumstances that the bulk of British air re-armament is now going into the expansion of the 2nd Tactical Air Force in Germany or that the Continental countries are engaged chiefly in creating tactical air power. The British Dominions are planning on the same assumption of huge land battles with attendant and encircling air operations to match. The United States, impressed anew by the importance of the air component in Korea, is building up more tactical air power. No matter how attractive may be the proposals of an air purist like the American Major de Seversky, who would have air power indeed indivisible and build it up for strokes which should be decisive in themselves, there can be no wide adherence on practical grounds to so violent a theory of military revolution while the risk of enemy occupation presents itself and the difficulty of ejecting the invader has to be faced. Tactical air power is an element in the plan for preventing occupation as well as for defeating an aggressor. It is an indispensable element and will remain indispensable until war on the ground can be made literally impossible by the exploitation of air power.

What gives the tactical air force an essential freedom of development is the mutual acceptance by Army and Air Force of the principles of air superiority. The Army may think of it as an umbrella; the Air Force may think of it as a foundation on which the whole structure of an air campaign must be based, but both are agreed at last that it is the primary function. How big an advance that marks can be understood by looking at the early story of British air power when the struggle for air superiority was forced on the air arm in attempting to satisfy the Army's first demand—for

reconnaissance. How much belongs to air superiority in these times is only to be determined by a comprehensive survey of the combined results of air combat, the bombing of airfields, the bombing of aircraft works, fuel supplies, communications, and radar posts, and of the preservation of friendly bases and equipment from damage or interference. One recent piece of evidence alone can point to the length of the chain on which air superiority may depend. Allied air power in Korea has been forbidden to touch sources of enemy strength beyond the Yalu river. Thus restricted, the Allied forces were unable to maintain air superiority sufficient to permit the full and free use of their heavy bomber element. The result was to be seen in continued and often inconclusive air battles over the Army's battlefields.

How air superiority is achieved is not the business of the Army, and yet the Army, as in North Africa, can be deeply involved in making it possible. The interaction of forces on the ground and in the air as it developed in North Africa will serve for a long time as the classic example of common effort in the construction of tactical air power. Bases are made behind the Army's screen. From those bases fighter aircraft operate to protect the Army from enemy air attacks. Gradually fresh bases are made, extra aircraft are flown in. Fighter protection is amplified and then reinforced by bombers. Imperceptibly the defensive effort begins to take on an offensive tinge. As the process continues the sphere of operations is expanded until interdiction can be accomplished, harassing of the enemy through his sources of supply can be undertaken, and direct support in ground operations can be given at small cost and with the assurance of valuable results. The technique was implicit in the air operations of 1918. The Army understood it in the African battles of 1943, and no army should misunderstand it in the future. The difference between 1918 and 1943 was that air power had won after twenty-five years the right to translate military needs into terms of air action. That right is evidently an essential requisite of tactical air power.

In 1918 plans for the Battle of Amiens were laid without even having the R.A.F. commander present at the conference. The R.A.F. were simply to be told by the Army commanders what was required. The tanks were to go through with the help (including the laying of smoke screens) of aircraft. The retreating enemy were to be attacked with bombs and machine-guns. The umbrella was to be maintained overhead and enemy aerodromes were to be attacked. Bridges over the Somme and some railway targets were prescribed. After four days the British onslaught was halted. The reason was that, although the R.A.F. held air superiority, no thorough plan of interdiction had been worked out and no provision had been made for the R.A.F. to pave the way for a continuing advance. The enemy had been able to bring in reinforcements and supplies. The R.A.F. got too late on to his communications. Reconnaissance during the battle was used only on the smallest scale. A subsequent analysis of the battle suggests that, if Allied air power had been concentrated, a force of 700 bombers could have been assembled and complete isolation of the battlefield could have been achieved. The present Chief of Air Staff, in his book on "Air Power and Armies" published in 1935, came to the conclusion that there were six enemy divisions coming in from the north which could have been delayed two days.

Imperfect understanding of the functions of air power in relation to land battles could still lead to the wasting of opportunities after nearly four years of fighting in that war, but the experience of that war was invaluable. The lessons were not learned soon enough for full application in the first great war. They were paid for in those battles, the subsequent analysis and dissection of which yielded to the R.A.F. a body of doctrine almost completely applicable to the conditions in which the second great war was fought. Writing in the middle 'thirties, Slessor even challenged those who would make a distinction between attacks on industrial areas (as strategic) and co-operation with the Army (as tactical) and insisted that there can be no precise calculation of the needs of an army's tactical air support. Even then he had to hammer home in relation to air power a basic military dogma concerning concentration. "We must make full use," he wrote, "of the mobility and tactical flexibility of air power and concentrate the maximum force on whatever task is likely to be decisive or contribute most usefully to the ultimate decision at the time."

No soldier, thinking in terms of land power, could dispute that conclusion, but many a soldier remained loath to acknowledge the value of air support in a battle applied outside the general area of movement associated with the battle. Nor was every soldier persuaded that the R.A.F. could assay a tactical situation and discern the right form of air action to give the maximum support to operations on the ground. The requisite confidence was to be generated in another war. It came only when air and army commander lived cheek by jowl on such terms that each could have continuous knowledge of the other's doings and of the reasons for them. It rested on proof in action, when air units kept pace with the troops in advance and retreat, that the air arm was as ready with close support as with the less easily perceived general support. The principle of first things first, of coping with a desperate situation before attempting action on classic models, perhaps never needed to be re-established. Always when a ground situation has been critical the aircraft have been found down among the smoke of the battle. They were down again, attacking front-line ground targets, for the first two months of the war in Korea in 1950 when the Chinese nearly succeeded in driving the Allied forces into the sea. Yet the deliberate preparation for front-line work has always been modest. In the British scheme it probably represents little more than 5 per cent. of the total. In the United States plan it seems no bigger, although the liking for special ground attack aircraft persists. Among the Russian forces it may well be higher, for the bulk of the Russian air arm remains tied to its armies; and armies unrestrained have usually liked to use air power simply as an extra few pieces of artillery.

Out of mutual confidence could come the full blossoming of tactical air power. Its possibilities are obvious. When suspicion is removed, and limitations are understood, and the reasons for doing things in a certain way are appreciated, enormous co-operative benefits can result. For example, not only can intelligence and reconnaissance be made to interlock but visual reconnaissance can be made acceptable to the Army as a supplement to photographic reconnaissance. Again, the Army can see for itself what advantages there are in accuracy of briefing and in choosing the right weapon for a particular task from having the aircraft properly based and from organising forward landing strips for refuelling and re-arming only.

The Army can satisfy itself of the wisdom of passing requests for air support through brigade direct to Army headquarters, alongside which is R.A.F. group headquarters, except, of course, for artillery observation and those special occasions when air contact teams work actually in the front line to keep the ground attack aircraft in immediate touch with the swaying fortunes of an engagement. Thus reassured, the Army in suitable circumstances can even trust the air support to take over the protection of a flank. The best example of that occurred when General Patton's force broke out of the Normandy bridgehead in 1944 and drove from St. Lo like an arrow for Paris.

The Germans obliged at the end of that year, when they made their bid from the Ardennes to split the Allied armies, with proof that the armoured thrust can no longer secure its flanks or its communications without air superiority. They succeeded in their drive just so long as thick weather kept the aircraft on the ground. After that, lacking air superiority, they were quickly halted, isolated, and destroyed. Still more recently Allied forces in Korea have been so impressed by the consequences of absolute air superiority that the average staff officer declines to draw deductions from experience accumulated in the earlier stages of that campaign. Armies have had every reason in recent operations to appreciate the immense value of the air umbrella. When, as in the early days in Korea, it is completely effective the ensuing freedom of offensive tactical operations brings most remarkable results. A North Korea operations order, captured during that period of no enemy air opposition, showed the nature of the handicaps imposed on ground forces by a dominant air arm. The order said: "Our experience in night combat up to now shows that we can operate only four to five hours in the dark since we start night attacks between 2300 and 2400 hours. Therefore, if the battle continues after the break of dawn, we are likely to suffer losses. From now on, use daylight hours for full combat preparations and start the attack after sunset. Concentrate your battle actions mostly at night and thereby capture enemy base positions. From midnight on, engage the enemy in close combat by approaching to 100-150 metres of him. Then, even with the break of dawn, the enemy planes will not be able to distinguish friend from foe, which will enable you to prevent great losses."

Most soldiers are persuaded now that first-rate direct support depends on air superiority and that they can help on the ground to secure it. They are keenly aware, too, of the share they can take in fitting the air weapon to the occasion. Once, the air arm had only two weapons—bombs and machine-guns. Now, it has the choice of four—bombs, cannon, rockets, and napalm (the air equivalent of the flame-thrower), with machine-guns still available on certain types of aircraft. Joint planning between army and group now takes account of the weapons as well as the targets "for to-morrow." This is true of both British and United States forces. Like so much else in tactical air, it grew out of the campaigns in North Africa. It has continued to work well in Korea. As the most recent source of evidence, the Korean campaign is specially interesting on the subject of weapons. Experience in that field, according to a semi-official report, seems to show napalm as a superior weapon to the rocket against tanks. Napalm has been taken to be an improvement on the fragmentation bomb for use against troops. Its effectiveness in that application appears high.

A napalm bomb is reported to spread over an area of 100 feet by 150-200 feet. In relation to a tank, this allows such a margin of error that the rocket cannot compete. The 5-inch rocket if it makes a hit on a tank is excellent. A near-miss with a rocket is a dead loss; with napalm a near-miss usually means that the tank is put out because the intense heat destroys insulation and other rubber fittings and frequently explodes the ammunition carried inside the tank. The same report from Korea also declares the machine-gun (no doubt the .5 calibre) best against vehicles and trains.

In fixing on targets and the weapons to deal with them, both army and group have the same informations at their service. Intelligence, compiled from the usual diverse sources, is amplified and brought up to date by reconnaissance photographs and reports. Visual reconnaissance is now so highly valued that some squadrons in the British and United States forces are specially trained in this duty. In the R.A.F. all pilots in these squadrons are officers. They undergo the normal fighter training and in addition they are trained in navigation and in the finding and identifying of targets. Such units can be best trusted to make armed reconnaissances and to attack targets of opportunity when an interdiction operation is in progress. Their more humdrum tasks of visual reconnaissance, particularly in a changing situation, fill in the gaps between photographic sorties and occasionally take on the character of the true scout, detecting signs of change and giving warning of it before photographs can come to hand. They are in the true line of succession to those who, in 1914, first used the aeroplane for scouting. In another sense reconnaissance is being strengthened. Electronic devices for detecting enemy movements in the dark or in thick weather are being added to the equipment and have been tried in Korea. The information on which air action is taken should thus be comprehensive and current, since reports and photographs can be dovetailed into the expert intelligence advice about how best to block a railway line or to destroy a bridge or to drive transport off a main road.

Here is the background of efficient tactical air power as applied in conditions of air superiority. The temptation is to make the fighter, which secures the battlefield against enemy air incursions, serve also for most of the other functions. It can be made to carry bombs or rockets. It has cannon. It can be fitted with cameras. If it can be turned into an all-purpose aircraft a marked advantage in the supply, repair, and maintenance organisation can be reaped. The R.A.F. has long held the view that the fighter should be the main instrument of tactical air power, but the tactical air force is gradually being forced by developments to accept a bigger measure of diversity. The jet fighter, for instance, has a remarkably short duration if it is required to indulge in low-flying attacks. There is room also for doubt as to whether the single-seat fighter can be fitted to use the new electronic devices. The all-weather fighter, suitable for use by day or night, tends to be a two-seater. It carries interception radar and could presumably carry reconnaissance radar. We have yet to learn how much it sacrifices in speed as compared with the single-seat interceptor, without which local air superiority apparently cannot be maintained. A further question which presents itself is whether or not the fastest fighter, designed for high speed and for high-level operation, is suitable for any form of reconnaissance. These are matters with which the Army could



Vickers Supermarine Swift single-seat jet fighter



Hawker Hunter single-seat jet fighter

not be expected to cope. They underline the wisdom of keeping air power and ground forces separate, with close links at the top for operational co-ordination.

Tactical air power would seem obliged in the future to have four layers, and on occasion five. Up forward should be a layer of aircraft suitable for ground attack. These will be employed in the main on interdiction duties, helping to isolate the battlefields, to forbid movement in the enemy's back areas, to attack dumps, transport, troop concentrations including armour, and in rare crises giving direct support to the front line. Behind them should lie the units to provide the fighter screen for preserving local security or escorting the day bombers on their attacks. Their duties include offensive sweeps to weaken or divert the enemy's air power as well as the interception of marauders or reconnaissance aircraft. In the next layer should be found the all-weather fighters, charged particularly with night defence but capable also of taking over certain reconnaissance duties in thick weather. The subject of offensive air action for tactical purposes in the dark appears to be regarded sceptically by the United States forces, although they approve so warmly of intrusion that they are to use the British Canberra bomber as an intruder. British experience with night attacks on transport in Europe during World War II was not as encouraging as was hoped. If, with new apparatus, night interdiction can be undertaken with more success, the duty could be expected to fall on the all-weather fighter. In the fourth layer of the tactical air force will be the light bombers of medium range, carrying a bomb load almost as big as the "heavies" carried in the last war. Behind them again, ready for use in long-distance support of the military situation, stand the medium and heavy bombers. The employment and control of this network of air power is in the hands of an air commander whose business is to understand the capacity, limitations, and special characteristics of the force at his disposal and so to exploit its mobility and flexibility as to make it contribute most at the decisive point.

Armies have been known to approve warmly the work done by a tactical air commander. Army commanders, whether wholly satisfied or not by the translation of their requests into air action, are now so involved in the joint planning that they can see many reasons behind the air plan of campaign. The emollient effect of understanding something of the air situation is illustrated in the tribute paid by General Walton Walker, commanding the U.S. 8th Army in Korea in 1950. He wrote: "No request for air support that could possibly be furnished has ever been refused." What the tactical air commander would like to hear an army commander say is that the form of support contributed by the air throughout a campaign contributed the greatest possible help at every stage. Tedder's greatness in the Mediterranean rested on showing the customers what they wanted. He had to convince the Navy and the Army of the essential interdependence of the three Services; of the need for bases to protect the sea lanes to secure supplies for the joint contriving of victory; of the futility of air "in penny packets" to serve sectional interests. Possibly the air must continue to produce the genius in every campaign who can satisfy the Army of his competence in devising the right strategy in a given situation. The sphere of tactical air cannot be governed by dogma or confined, except in the most general terms, in a military manual. Nor can its functions be

prescribed from the ground up. The airman must set his own stage and produce his own contribution. What matters is that he should be able to take the wide view and be free from suspicion of playing his own hand for his own advantage.

When World War II ended Tedder held that it was already out of date. Yet in conception and in general form to-day's tactical air force differs little from that which swept forward over France, Belgium, and Germany and, preserving air superiority, cut at the means of enemy mobility and at the sources of his strength. Range has been increased. The advent of the atomic bomb will lead to the better protection of supplies. The risk of air interference with surface communications may encourage the wider use of air transport. Radar reconnaissance will evoke some response in electronic camouflage. Guided missiles will affect the tactics and technique of air combat. Electronic aids will alter the processes of bombing and so intensify the difficulties of interception and defence. The ways of 1945 may indeed be out of date and the tactical air commander will be faced with different circumstances, but his basic task remains unchanged. His duty, in words set down so long ago as to be almost archaic, will still be "to create and maintain an air situation such as will assist the Army to achieve its object and will prevent undue interference from enemy air attack." And it will be to read into that phrase "assist the Army" all those things which the soldiers had never thought of when they wrote that definition, and to do them in the way that air experience dictates. The equipment and the tactics of tactical air forces are held to be close Service secrets. The onlooker is required to have faith that technical and scientific progress is being duly harnessed to the needs of air power and that all provision is made for effective operation in changed circumstances. Air superiority, without which the comprehensive support cannot be given, demands that equipment shall meet the occasion. An Air Staff which is devoting so much attention to the expansion of the tactical air forces must be presumed to recall the value of the eight-gun fighter and of the radar network which served it. The modern versions of the means to air superiority are believed to be in development. They will have to serve the old ends through much the same machinery as employed the weapons of 1945.

E. COLSTON SHEPHERD

CHAPTER XXX

THE UNITED STATES AIR FORCE *

HISTORICAL SURVEY

EARLY DAYS

DECEMBER 17, 1903, will be for ever memorable in the history of flying, for on that day the Wright brothers made the first flights in a power driven flying machine at Dayton, Ohio, from what is now the airfield known in their memory as Wright Field. After many experiments with gliders they built a machine with an eight horse-power motor, and it was in this aircraft that the first flight, of twelve seconds duration, was made by Orville Wright. Only a handful of spectators were present to see this and the three subsequent flights made by the brothers on that momentous morning, the final flight lasting for fifty-nine seconds.

The incident is graphically described by Orville Wright in a narrative account, included in the first volume of "The War in the Air," by Sir Walter Raleigh :

"Into the teeth of the December gale the flyer made its way forward with a speed of ten miles an hour over the ground, and 30 to 35 miles an hour through the air," and the account ends by saying that, once the brothers had established in these four flights that their machine would fly, "we at once packed our goods and returned home, knowing that the age of the flying machine had come at last."

But the potentialities of the newly born infant were not appreciated in the land of its birth, and many years were to pass before flying came to be regarded seriously in the United States. Military aviation, in particular, languished, and it was not until World War II that the Air Force became the powerful instrument we now know. So little regard was paid to the development of aircraft in the early days that in the 1914-18 War, although large numbers of Liberty engines, designed and produced in the States, were sent overseas, not a single combat aircraft of American design and production had reached the Western Front by the time of the Armistice in 1918, although a trickle of British designed aircraft, principally D.H.4B's, built in the United States, reached the Western Front from May, 1918, onwards.

The birth of service aviation in the United States dates back to August 1, 1907, when the Aeronautical Division was formed under the Signal Corps, apparently because the most important use then foreseen for aircraft was the carrying of messages. In the succeeding years little or no attention was paid to aviation, and when the United States entered the first war in April, 1917, they were completely unprepared for the air war. Only 224 aircraft in all had been acquired between 1909 when the first military aircraft was bought, and April, 1917.

1917-18 WAR

In consequence, in spite of the most strenuous efforts to remedy their deficiencies, American aviation achieved very little by the time of the

* This article is based mainly on Vol. I of "The Army Air Forces in World War II," the American official history, published by the Chicago University Press, and on information supplied by the Directorate of Public Relations, Headquarters, United States Air Force.

Armistice, although by that time plans for what would have been a vast expansion were well under way. The first American squadrons only reached France in April, 1918, and by November there were 45 squadrons in operation, against a planned eventual expansion to 202 combat squadrons (originally conceived as 386 squadrons). 781 enemy aircraft were shot down for the loss of 289, and the total weight of bombs dropped was 138 tons, whilst the deepest penetration behind the enemy lines was to a depth of 160 miles. The total strength had reached 20,000 officers and 149,000 men by the Armistice.

The serious defects revealed had, however, resulted in one important improvement in organisation, in that, on May 20, 1918, aviation was removed from the responsibility of the Signal Corps, and the U.S. Air Service was formed as a separate branch of the Army.

Although the ambitious plans formulated in 1917, which had included such phrases as "regiments and brigades of winged cavalry mounted on gas driven flying horses" to "sweep the Germans from the sky," never came to fruition, the war had at least awakened some of the officers of the Air Service to the potentialities of aircraft. Of these, Brigadier-General William Mitchell, who was to become such a controversial figure in the inter-war years, was the foremost, and it is probably true to say that he was primarily the founder of American air power.

THE INTER-WAR YEARS, 1919-39

These years can be summed up as being mainly devoted to the struggle for recognition. General Arnold's autobiography, *Global Mission*, gives a vivid picture of the frustration and struggles of those years between the wars. Much of the lack of interest in air power was due to the outlook of the Navy and Army, who deliberately decried the potentialities of aircraft. They were enabled to do this the more easily in that the Air Corps, as it was renamed on July 2, 1926, was part of the Army, and indeed did not receive fully independent status until after the end of the 1939-45 war. Possibly because of this subservience to the Army, the American Navy was eventually convinced of the value of aircraft even before the Army, and this has resulted in the Naval Air Arm being built up into almost as powerful a force as the Air Force, with consequent incessant wrangling as to the respective roles of the two air forces.

The main controversy during the struggle for recognition centred round the differences between those who regarded aircraft as auxiliary weapons of the Army and Navy, and those who believed that strategic bombardment would be the main war-winning weapon of the future. In this controversy Brigadier-General Mitchell was the leading figure in the early 'twenties. In spite of the opposition of the Navy, who did not wish the trials to take place, he proved that battleships could be sunk by bombing, by sinking the ex-German 'Ostfriesland' in July, 1921. This incident added fresh fuel to the fire of Mitchell's advocacy of air power, and culminated in his court-martial in 1925, which became a *cause célèbre* unique in American military history, and which was known to the American public as "Billy Mitchell versus the Brass Hats."

In spite of Mitchell's advocacy, little progress was made between 1919 and 1939. After the Armistice in 1918, the strength of the Air Service

was rapidly reduced to 20,000 officers and men, and it remained at about this figure until July 1, 1939, when the strength was only 500 more than it has been nineteen years before.

Although the size of the Air Corps, as it had become in 1926, remained unchanged, there was a growing belief during these years in the possibilities of strategic bombardment, and this at least led in 1935 to the production of the first heavy bomber, the B.17. Only 13 of these aircraft had actually been delivered when Germany attacked Poland in September, 1939, but nevertheless the B.17 was the forerunner of the B.24 and the B.29, and the heavy bombers of to-day.

An important change in organisation had, however, been made on March 1, 1935, as a result of an inquiry into the control of the Air Corps. The somewhat curious conclusion was arrived at that, "the time has arrived for the Air Corps to become in all respects a homogeneous part of the Army," and that less, not more centralised control was the cure for Air Corps ills. In pursuance of this policy a G.H.Q., Air Force, was formed, which controlled all operational units, and the Commander of which reported direct to the Chief of Staff of the Army. The Chief of the Air Corps was responsible only for individual training, procurement and supply, and had no responsibility for operations.

Somewhat naturally this dual control proved unsatisfactory, but it lasted until March 1, 1939, when, under the stress of an incipient re-armament programme, control of the Air Corps was concentrated under the Chief of the Air Corps.

Meanwhile the argument had continued between the Army and Navy as to the respective roles of their air forces. This argument centred in the main around the responsibilities of the two services for coast defence, and an agreement which attempted to define their two spheres had been concluded in 1931. So rigid was the line of division as laid down that as late as the year of the outbreak of the war in 1939, the Air Corps was still trying to secure the abolition of a restriction which limited the flight of its aircraft seaward to 100 miles from the shore. That such an unrealistic probation should have been in force for so long gives some indication of the unyielding attitude of the two protagonists.

PREPARATIONS FOR WAR, 1939-41

In 1938 there was a radical change in the foreign policy of the United States. In January of that year President Roosevelt declared that the national defences were inadequate in face of the warlike preparations abroad, and asked for large appropriations to improve the defences. The sums allotted in that year were devoted mainly to strengthening the Navy, but in 1939, when the President asked for much larger sums, more than half was for the Air Corps.

The first expansion programme in 1939 approximately doubled the existing strength of aircraft and men, and further expansion programmes followed rapidly upon one another as the international scene darkened. There was a further increase in the Air Corps when war broke out in September, 1939, and again following the fall of France. By the time the United States entered the war on December 7, 1941, the actual strength of the Air Corps was 152,569, and an expansion to 348,535 had

been authorised, with a total of 84 operational groups. (A group is roughly equivalent to an R.A.F. wing.)

Although few of these groups were operational on the outbreak of war, the expansion plans were well under way, and the Air Corps was thus able to get off to a flying start. This was particularly so in the field of aircraft production, in which immense strides had been made since 1939. In 1941 some 46,000 aircraft were produced, and plans were in train for 60,000 in 1942, with an eventual aim of 10,000 aircraft a month. A large proportion of the total production was allotted to Great Britain both before and after the United States entered the war, and substantial numbers went to Russia after she entered the war.

A further important step in the gradual progress towards autonomy was taken on June 20, 1941, when the Army Air Forces came into being, with General Arnold as Chief of the Army Air Forces, and directly responsible to the Army Chief of Staff for all air matters. Under General Arnold there was the Chief of the Air Corps, responsible for supply, and the Commanding General of the Air Force Combat Command, responsible for operations.

1941-45 WAR

In spite of all the neglect and controversies of the inter-war years, the war, when it came, found the U.S. Army Air Force (with a strength of 300,000 officers and men, and 12,000 aircraft), and the aircraft industry well prepared for the accelerated expansion programme with which they were immediately faced. By the end of the war the strength of the Air Force had risen to 2,359,000 officers and men, there were some 224 groups, with some 70,000 first-line aircraft, and aircraft production included over 8,000 heavy bombers and 12,000 fighters a year. Altogether, between 1940 and 1945, 229,230 aircraft were produced in American and U.S. financed Canadian factories, and the number of pilots trained reached 105,000 in the peak year of 1944.

When the United States entered the war, there was naturally considerable discussion as to the proportion of American aircraft production which should continue to be allotted to the British forces. Thanks to the goodwill and understanding existing on both sides of the Atlantic, the allocation of aircraft led to remarkably little friction, and was made on the principle that as far as possible every American made aircraft should be manned and fought by American crews, subject to the corollary on the British side that it was the intention to "bring into action against the enemy at the earliest possible date in the appropriate theatres the greatest strength in fully trained air forces that it was possible to create out of the combined aircraft production, trained manpower and shipping of the United Nations."

An issue on which there was divergence of opinion was in regard to daylight bombing. The main striking arm of the Royal Air Force, Bomber Command, was intended for operation by night, as it was considered that the losses likely to result from attacks by day would be prohibitive in the face of the fighter opposition of the enemy, particularly in the case of attacks on targets in the heart of Germany, when long distances would have to be traversed over enemy territory. The U.S. Air Force, on the other hand, had long been committed to a policy of bombing precision targets in daylight from high altitudes. In spite

of initial setbacks, the Americans adhered to their policy, which was fully justified in the end, as it meant that, from the time the American heavy bombers (of the Eighth Air Force) were fully deployed in the United Kingdom, Germany was subjected to ceaseless attacks by night and by day, the so-called "round the clock" bombing that proved so important a factor in the ultimate defeat of Germany.

The initial build up was slow, and it was six months after America entered the war before the first flights over Europe were made. Appropriately enough, July 4, 1942, was chosen, when six Eighth Air Force light bomber crews flying Bostons borrowed from the Royal Air Force took part in a routine sweep against enemy airfields. The first bombardment mission took place on August 17, 1942, and by the end of the war the U.S. Army Air Force had dropped some 1,525,000 tons of bombs on Germany and occupied territory, and 500,000 tons on Japan. This was indeed a remarkable advance on the 138 tons dropped in the 1917-18 war.

When America entered the war another difficulty that arose was due to the fact that, whilst the U.S. Army Air Force was subordinate to the Army, the Royal Air Force was co-equal with the other British services. This difficulty came to a head at Arcadia, the conference held in Washington at the end of December 1941, and which was the first of the series of war conferences to be held. The difficulty was resolved by General Arnold, the Chief of the Army Air Forces, sitting in as the equal of the Chiefs of Staff of the Army and Navy. Subsequently this arrangement was officially recognised, and General Arnold was made a full member of the Combined Chiefs of Staff (the Anglo-American committee for the higher direction of the war), and the Joint Chiefs of Staff (the corresponding American committee). This principle was adopted at all levels in Allied planning and operations, and amounted in practice to giving the U.S. Army Air Force the independent status that it did not achieve in name until after the war.

1945 TO 1951

Following a review by General Eisenhower of the future organisation and role of the armed forces, the U.S. Air Force, as it was now named, became a separate service on September 18, 1947, of equal status with the Army and Navy, under the National Security Act of 1947. The political head is the Secretary of the Air Force, who is not in the Cabinet, and all three services come under the Secretary of Defence, who is a member of the Cabinet. The American defence organisation is thus similar to that in this country, with one exception, in that their Joint Chiefs of Staff Committee has an independent Chairman in addition to the representatives of the three services.

The Americans emerged from the war in 1945 fully convinced that air power was able to achieve all that had been so forcefully claimed for it in the past by General Mitchell, and his successors. As a result it may be that American thought has tended since the war to over-estimate the potentialities of aircraft, and this tendency was intensified by their possession of the atomic bomb. Strategic bombing thus became, after 1945, the declared first plank in American defence, and there was a revulsion of feeling against the Air Force when they were unable to finish off the Korean war on their own in a matter of days, as so many people in the

States expected them to do. Since then more sober thoughts have prevailed, and it has been realised that all arms are needed to win a war. One result has been, however, to revive the Navy's claim to strategic bombers, and to the provision of a giant aircraft carrier of 57,000 tons from which to operate them, although why, with a world-wide chain of strategic air bases, a long-range bomber should be more efficiently operated from a ship than from an airfield is not immediately obvious. All that is clear is that the difference of opinion between the American Navy and Air Force as to the role of aircraft, which led in 1949 to the removal from office by the President of the Chief of Naval Operations, Admiral Denfield, has by no means been resolved, and is likely to continue for some time to come.

ORGANISATION *

HIGHER CONTROL

The Secretary of Defence, who is a member of the Cabinet, administers the Defence Department through four main sections, the Armed Forces Policy Council, the Joint Chiefs of Staff, the Munitions Board, and the Research and Development Board.

The Department of the Air Force is administered by the Secretary of the Air Force, who is responsible to the Secretary of Defence, but who is not in the Cabinet, although he is appointed by the President.

Under the Secretary, the Chief of Staff, U.S. Air Force, commands the Air Force. The headquarters is located in the Pentagon Building, Washington, and is divided into five main branches, each under a Deputy Chief of Staff, namely, Comptroller (Finance), Research and Development, Personnel, Operations, and Materiel. There is also an Inspector-General.

COMMANDS

There are a number of Commands and other formations controlled directly by the headquarters. These are:

Strategic Air Command. Headquarters, Offutt Air Force Base, Omaha, Nebraska.

Operates the global striking force, through the 2nd, 8th, and 15th Air Forces.

Continental Air Command. Headquarters, Mitchell Air Force Base, Hempstead, Long Island, New York.

Responsible for the training of all reserve forces, including the Air National Guard and the Air Force Reserve. Also supervises the Civil Air Patrol. The Command is organised in four Air Forces on a geographical basis.

Air Defence Command. Headquarters, Ent Air Force Base, Colorado Springs, Colorado.

Responsible for the air defence of the United States, through three subordinate air forces, the Eastern Air Defence Force, Stewart Air Force Base, Newburgh, New York, the Central Air Defence Force, Kansas City, Missouri, the Western Air Defence Force, Hamilton Air Force Base, San Rafael, California.

Tactical Air Command. Headquarters, Langley Air Force Base, Hampton, Virginia.

* See diagram opposite.

Responsible for co-operation with land, naval and/or amphibious forces, and for training for this role. This Command was formed as a result of the short comings disclosed in Korea, which indicated that changes were necessary in the training methods for co-operation with ground forces. There are two subsidiary Air Forces, the 9th and 18th, which include Fighter and Attack Bomber Groups. The Command is also responsible for tactical reconnaissance and tactical troop carrying.

Air Training Command. Headquarters, Scott Air Force Base, Illinois.

Responsible for all air and ground training of the regular forces, through the Flying and Technical Training Divisions.

Air Materiel Command. Headquarters, Wright-Paterson Air Force Base, Ohio.

Responsible for the provision, storage and distribution of all aircraft, equipment and supplies through seven Air Materiel Areas, at Sacramento, Ogden, San Antonio, Oklahoma City, Mobile, Warner-Robbins, and Middleton.

Military Air Transport Service. Headquarters, Andrews Air Force Base, Washington.

Formed on January 1, 1948, by combining the Air Transport Command and the Naval Air Transport Service, in order to avoid duplication and overlapping between the two services. It has three subsidiary Divisions, the Atlantic Division, Westover Air Force Base, the Continental Division, Kelly Air Force Base, and the Pacific Division, Hickam Air Force Base, Hawaii.

M.A.T.S. also controls the Air Rescue Service, the Flight Service (Control and Reporting system), the Air Weather Service, the Airways and Air Communications Service (radio and communications facilities).

United States Air Forces in Europe. Controls the 3rd Air Force, United Kingdom, and the 12th Air Force, Germany.

Far East Air Force. Controls the 5th Air Force, Korea, and the 20th Air Force, Japan.

Alaskan Air Command.

Caribbean Air Command.

North East Air Command. (Newfoundland, Labrador and Greenland.)

Philippine Command. (13th Air Force.)

Headquarters Command. Bolling Air Force Base, Washington, D.C. The administrative unit of headquarters, U.S.A.F.

Air Proving Ground Command. Eglin Air Force Base, Florida.

Responsible for testing new equipment.

Special Weapons Command. Kirtland Air Force Base, Albuquerque, New Mexico.

Responsible for atomic energy development as affecting the Air Force.

Air Research and Development Command, Baltimore. Maryland.

Responsible for long term research and development.

The United States Air Force Security Service.

Responsible for the monitoring of all communications for security.

The Air University. Maxwell Air Force Base, Montgomery, Alabama.

The University was formed in 1946, and is responsible for all forms of education in the Air Force. It includes the Air War College, the Air Command and Staff School, and the Air Tactical School, all at Maxwell,

the School of Aviation Medicine at Randolph Air Force Base, Texas, the Special Staff School at Gunter Air Force Base, Montgomery, and the Institute of Technology, Wright-Paterson Air Force Base, Ohio.

LOWER FORMATIONS AND UNITS

The operational unit is the Squadron, which has two or three flights.

The smallest formation is the Group, which consists of a Headquarters, and two or more Squadrons.

The Wing consists of a Headquarters, Combat Group, Maintenance and Supply Group, Air Base Group, and Medical Group. It is thus the lowest self-contained formation capable of operating and maintaining itself independently.

The Air Division consists of a Headquarters and two to five wings.

The Air Force consists of a Headquarters and two or more Divisions, and the Air Command of a Headquarters and two or more Air Forces.

AIR RESERVE FORCES

Air National Guard. Trained to a standard that enables it to operate on the outbreak of war. It is organised in twelve composite Groups covering the whole country, and including 27 Fighter, Light Bomber and Transport Groups, 27 Air Service Groups, 12 Aircraft Warning Groups, 12 Aviation Engineer Companies, 3 Tow Target Squadrons, or 526 units in all.

Air Force Reserve. This is the mobilisation reserve, to bring existing units up to strength and to form new units.

Civil Air Patrol. This is a volunteer semi-military flying organisation, intended to supplement the regular Air Force with civil aircraft in war. There are 52 Wings, located in each of the 48 States, Colombia, Hawaii, Alaska and Puerto Rico.

AIRCRAFT

The main types of aircraft with which the U.S.A.F. is equipped are:

Fighters. Republic F.47, North American F.51, Lockheed F.80, North American F.82, Republic F.84, North American F.86, Northrop F.89, Lockheed F.94.

Bombers. Douglas B.26, Boeing B.29, Convair B.36, North American B.45, Boeing B.47, and B.50.

Reconnaissance. Douglas RB.26, Boeing RB.29, Convair RB.36, North American RB.45 and RB.51, Lockheed RF.80.

Liaison. Convair L.5, and L.13, Boeing L.15, Aeronca L.16, Ryan L.17.

Transports. Beech C.45, Curtiss C.46, Douglas C.47, C.54 and C.74, Fairchild C.82, Boeing C.97, Fairchild C.119, Lockheed C.121, Chase C.122, Douglas C.124.

Search and Rescue. Boeing SB.17, Grumman SA.16, Boeing SB.29.

Helicopters. Sikorsky H.5 and H.19, Bell H.12.

Trainers. North American T.6, Beechcraft T.11, North American T.28, Convair T.29, Lockheed T.33.

FUTURE PROGRAMME

No details have been published of the first line aircraft strength, or of the expansion programme now in progress. The personnel strength in March, 1950, was 412,306, and it was announced in July, 1950, that the Air Force would expand to 95 Groups in the next two years, after having been reduced from 60 to 48 Groups in 1949. The composition of the 60 Groups at the end of 1948 was, 2 heavy bomber, 13 medium bomber, 3 light bomber, 22 day fighter, 3 all-weather fighter, 4 tactical reconnaissance, 4 strategic reconnaissance, and 9 troop carrier.

Presumably the composition of the Groups is still much the same as in 1948, but in the expansion now taking place a great part of the increase is being devoted to strengthening the tactical air forces in support of the ground forces, as a result of the lessons from Korea.

Speaking at Missouri on June 7, 1952, President Truman said that the U.S.A.F. now had 15,000 aircraft in active use, apart from the aircraft of the Naval and Marine forces. These aircraft were organised in 91 Groups, with almost a million men on duty, and the 95 Group goal set in 1950 for this summer should be attained. Present plans called for completing a 143 Group Air Force in two or three years.

In the same speech the President said: "We are not trying to build the biggest air force in the world. We are trying to build the best one, backed up by the industrial capacity to expand it rapidly if need be, and to keep it always up to date."

Although no details are available of the present composition of the U.S.A.F., it is clear that the United States has built up a large and formidable Air Force, which is becoming an increasingly powerful deterrent to any potential aggressor.

W. M. YOOL

CHAPTER XXXI

FOREIGN AIR FORCES

THE INTEREST of the following survey must necessarily centre on Russian equipment; but it must be frankly admitted at the outset that authentic information on this—as, indeed, on all other aspects of Russian military flying—is meagre in the extreme. Certainly, considerably more is known concerning the Mig-15 fighter and the Ilyushin twin-jet light bomber than when the last volume was sent to press, and the gist of the new data is duly recorded; but the types named are the only modern designs concerning which recurrent eye-witness reports (from Korea and Germany respectively) have been available. True, columns of verbiage and imposing representations have been given currency throughout the free world; but where this has concerned “new types,” other than those named, much of it has been strongly suspect, if not patently bogus.

Reference to the paragraphs dealing with the smaller air forces will disclose that outside Sweden and France, and, to a smaller degree, Holland, Italy and Argentina, little technical advance is discernible beyond the planned introduction of standard American and British equipment.

RUSSIA

Though much remains to be discovered about the Mig-15 fighter—the only Russian jet positively identified in the Korean campaign—it would be gratifying if as much information as is now available on this machine had been forthcoming for its contemporaries in other classes.

Indications are that the Mig-15 (the design of which is altogether too Germanic in concept to call for further comment on its antecedents) was first flown during July, 1947—that is, two or three months earlier than its American counterpart, the North American Sabre. At first the landing speed was excessively high, and control at the lower end of the speed range poor. Changes in design, however, apparently overcame the more serious handling troubles, and the structure was stiffened where necessary. Water injection and after-burning were tried with the Russian-built Nene-type turbojet, and though it does not seem that any of the Migs encountered over Korea have had an afterburner, water injection is standard. Initially one 37-mm. and one 20-mm. gun are thought to have been specified, but present indications are that the normal armament is now three guns, one of 37-mm. calibre and two of 23-mm.

Concerning the fighting qualities of the Mig, we can do no better than to quote the views of Major J. A. Jabara, who has had extensive first-hand experience in Korea. In his opinion, the Mig-15 is faster above 35,000 feet than the F-86A and E Sabres, though the difference is only a matter of a few knots, building up with increase of height. Altitudes of the order of 50,000 feet are attainable.

Below 35,000 feet the Sabre appears markedly superior in all important aspects of performance, particularly in diving speed. Like all current turbojet fighters, the Mig takes two or three minutes to work up to its maximum speed from cruising thrust, and by virtue of this fact American

fighters of much lower maximum speed have scored numerous successes. An important contributing factor is, however, the American radar gun-sight now standardised.

Having been designed primarily for interception duties, and being of small dimensions, the Mig carries a relatively small fuel load, and even with auxiliary tanks under the wings its range is much inferior to the Sabre's. There is no evidence of structural weakness; in fact, the effect of "fifty calibre" fire has often proved very disappointing unless some vital spot in the fuselage has been hit.

In brief, the Mig-15 is a first-rate fighting aircraft, though it is doubtful if the type can ever be developed to the pitch of efficiency which is expected of forthcoming Sabres.

Concerning the second type of swept-wing Russian fighter, to which reference was made in the previous contribution, very little information has been forthcoming. In general concept this type bears a close resemblance to the Mig-15, though the wing is set in shoulder position. There is no confirmation that rocket-propelled target-defence interceptors are in service, though there is strong evidence that aircraft of the type have been constructed.

Notwithstanding the introduction into service of very large numbers of Mig-15s, it is believed that quantities of the piston-engined La-11s and Yak-9s remain.

The older types of jet fighter—the twin-jet Mig-9 and single-jet Yak-15—are likewise still in service, but a number of Yaks are known to have been turned over to training duties and a two-seater variant has been identified.

Reports of a twin-jet night and all-weather fighter are persistent (indeed, such a machine is virtually a necessity in any well-balanced air force to-day), and among the new types said to have appeared at the Tushino Display in July, 1951, was a twin-jet fighter/bomber of unknown designation. On the same occasion, incidentally, new jet fighters credited to the designers Mikoyan, Lavochkin, and Yakovlev are reported to have put in an appearance, together with new types of naval aircraft, including a Tupolev twin-engined flying-boat, a single-engined amphibian, and a new type of helicopter, to which further reference will later be made. A new type of Yak liaison aircraft is said to have taken off in about 15 yards.

For many months past a new type of twin-jet bomber has been operational in Germany and is known provisionally as the "Type 27." Supposedly of Ilyushin design, this machine is in the class of the Canberra but carries tail armament in addition, it is believed, to fixed, forward-firing guns. The wing is of high aspect ratio and the nacelles are underslung. Beneath them are fairings to accommodate the main wheels which turn through 90 degrees to lie flat when retracted. American intelligence sources credit this machine with a range of 1,300 miles and a speed of about 500 m.p.h. A trainer version, with an additional cockpit, has been observed in Germany.

A second type of twin-jet bomber, believed to be intended for similar duties and provisionally designated "Type 35," is faster. According to an authoritative American estimate, about 800 of these two twin-jet bomber types were in service early in 1952, and annual production is estimated at about 1,000. It is supposed that eventually these machines will entirely displace the piston-engined Tu-2 and Pe-2 attack bombers.

As is now well known, the standard Russian long-range bomber (sometimes called the Tu-4) is a copy of the American Boeing B-29 Superfortress (R.A.F. Washington), and there is no reason to suppose that the performance of this machine is in any way superior to the now-obsolete American version. Some hundreds of the type are available and, according to General Vandenberg, the United States Air Force Chief of Staff, a machine of newer and larger design (though smaller than the American Convair B-36) has been displayed. It is the General's belief that this machine could have a radius of action extending from Soviet bases deep into the United States, and it is commonly supposed that the type concerned has turboprop power.

For specialised ground-attack duties the armoured two-seater Il-10, with a bomb load of about 2,000 lb., is still in operation. Performance, however, is far below modern standards, the maximum speed being less than 350 m.p.h.

In addition to the Yak jet trainer already mentioned, there are large quantities of Yak-11 piston-engined machines (tandem-seaters but in the class of the Percival Provost); smaller Yak-18s, comparable with the Chipmunk, though of somewhat higher performance; and numerous older types such as the Po-2 biplane. North American Mitchell ex-bombers serve for certain types of advanced training.

Transport squadrons are believed to be equipped mainly with the military version of the Il-12, which has a civil counterpart operated on Russian, Polish, and Czech airlines, and with the Li-2, the Russian-built version of the Dakota. Both types are employed for general troop and freight transport and for the dropping of paratroops, and for this last purpose it became known late in 1951 that the B-29-type bomber has also been adapted for paratroop work. Two hatches, fore and aft of the bomb bay, were seen on one occasion to open, and thirty-three parachutists duly emerged. Large freight-carrying gliders appear to have been retained in service, though this class of aircraft is out of favour elsewhere.

As an indication that Russian technical progress is not confined to the jet fighter and bomber classes, final reference may be made to the helicopter already mentioned as having appeared at the Tushino Display. This machine bears a certain superficial resemblance to Bell, Sikorsky, and Bristol designs, and is estimated to seat four or five persons. A radial engine of about 700 h.p. is the probable power plant. A convincing demonstration by nine of these machines was witnessed at Tushino.

SWEDEN

Fourth in order of size among the world's air forces, the Royal Swedish Air Force comprised, in September, 1951, well over a thousand combat aircraft and a personnel strength of about 17,000 officers and men. Included in this figure were some 6,000 civilians. The 17 combat units were composed of 50 squadrons, divided as follows: 10 day fighter wings, with a total of 30 squadrons (18 of which were being strengthened by 50 per cent.); 1 night fighter wing, composed of 3 squadrons; 4 attack wings, having 12 squadrons; and 1½ reconnaissance wings, with a total of 5 squadrons. Additionally there were training and base units, and the central workshops. For the fiscal year 1951-52 the total cost required to

maintain this force was to represent a little more than 30 per cent. of the nation's total defence budget.

Seven classes of aircraft are officially recognised and are distinguished by the following symbols: "A" attack, "B" bombing, "T" torpedo, "J" fighting, "S" reconnaissance, "Sk" training, "Tp" transport or ambulance.

The latest and by far the most efficient day fighter now in service is the J-29 (manufacturers' designation Saab-29), a product of the Svenska Aeroplan A.B., of Linköping. This machine is in the same performance class as the North American Sabre F-86E and the Russian Mig-15, though slightly inferior to both these types in speed.

Very useful numbers of these efficient Saab fighters are already in service and a contract for at least 500 is known to have been placed. Colloquially referred to in Sweden as "The Barrel" by reason of its portliness, the J-29 is powered with a de Havilland Ghost centrifugal-flow turbojet of some 5,000 lb. static thrust, for which unit a licence is held by the Svenska Flygmotor A.B., of Trollhättan. The mainplanes are in shoulder position, are of thin section, and have a 25-degree sweepback. They are provided with leading-edge slots which are locked in the closed position when the trailing-edge flaps are up. A Saab power-booster system is used for aileron operation.

Due to the height and thinness of the wing it was impossible to stow the undercarriage therein and, in consequence, the main wheels, in addition to the nosewheel, retract into the bulky fuselage. The track is relatively narrow, the actual measurement being about 7 feet, and some aspects of ground handling have come in for criticism.

The fuselage itself is built in three sections and incorporates a straight-through air duct for the Ghost turbojet, the fuel tanks and the four 20-mm. Bofors guns. The tail structure is built out from the main fuselage and the tailplane is electrically adjustable. An operating switch is mounted on the pilot's control column and two different setting speeds are available, the lower being for high-speed trim, giving a change in setting of about 1 degree per second. As a precautionary measure the elevator has a mechanically operated trim tab. Geared tabs are fitted to both the rudder and elevator.

The cockpit is placed well forward and the pilot has an unusually good view. Additional to the four built-in guns it is possible to carry batteries of rocket projectiles under the wings, and operational aircraft already have provision for these.

The J-29 measures 36 feet 1 inch in span and is 33 feet 2 inches long. Performance details have not been released though it is claimed that the speed is "about 657 m.p.h." The climb is reported to be superior to that of the Sabre, and the range is generally considered to be superior to that of the Mig-15.

A Swedish Air Force officer with experience of the type reports that, although the 30-degree backward inclination of the Saab ejector seat felt unfamiliar at first, he found it comfortable. He speaks of "normal response" to control movements, though the hydraulically powered ailerons he found very light. Elevator control was on the heavy side and the aircraft was stable in the looping plane. Even on his early flights he did not find the landing difficult, though because of the aircraft's low-speed

characteristics plenty of concentration was demanded to avoid losing too much speed.

Much inferior to the J-29 in performance, though still a potent weapon, is the J-21R, utilised in various versions for fighting and ground attack. The J-21R dates from early 1947 and is a development of the piston-engined J-21A. It is powered with a de Havilland Goblin 2 or Swedish-built Goblin 3 turbojet, and is claimed to have been the first military aircraft to go into quantity production with an ejector seat. Performance of the J-21R is comparable with that of the de Havilland Vampire. Of this last-named type over 200 have been acquired, the majority being of the "export" Mark 50 type and designated J-28B to distinguish them from the earlier J-28s (Vampire 1).

The J-21A, although designed as a fighter, is now considered principally as a ground-attack aircraft. The engine is a Swedish-built Daimler-Benz DB 605, which confers a top speed of slightly under 400 m.p.h. This machine is the only piston-engined fighter of pusher type now in service.

For ground attack duties the single-seaters are supplemented by squadrons of B-18s and T-18s, each with two DB 605 engines. The T-18 has an unusually heavy forward-firing armament which can include a 57-mm. Bofors gun, having a rate of fire of 180 rounds a minute. As an alternative to the bomb load this class of aircraft can carry a torpedo, and there is provision for rocket projectiles under the wing.

Useful quantities of North American Mustang F-51Ds, known in Sweden as the J-26, are in service and are now considered primarily as ground-attack aircraft, though originally classed as fighters. They are standard in most respects.

For night fighting the de Havilland Mosquito 19, which bears the Swedish designation J-30, is normal equipment, and for reconnaissance a version of the original radial-engined Saab (forerunner of the Series 18 aircraft already mentioned) is available, in addition to the Spitfire Mark 19 (S-31) and the German Fieseler Storch (S-14), used for liaison flying and as an air observation post.

A miscellany of transport types is on charge, ranging from German Ju 86 landplanes and Dornier Do 24 flying-boats to de Havilland Doves, Beech C-45s, Noorduyn Norseman, and the small Saab Safir low-wing monoplane—the last-named serving for communication duties. A few Consolidated Catalina flying-boats are also available for patrol and rescue work.

Swedish Air Force trainers are mostly of the North American Harvard and Bücker Bestmann types, but orders were placed during 1951 for a development of the efficient little Saab Safir, to which reference has been made above. To be known as the Sk-50, this type has been somewhat strengthened and redesigned to take the American Lycoming 0-435-A engine of about 190 h.p. With its all-metal airframe, nosewheel undercarriage, proven power plant and lively performance (the top speed is about 170 m.p.h.), the Sk-50 is an attractive proposition. Production is to be undertaken in Holland, in view of Saab's preoccupation with the J-29 and other designs.

Of these designs the only one of which mention may be made is the Saab-210, a small delta-wing research machine which, powered with a British Armstrong Siddeley Adder turbojet, made its first flight early in

1952. It is widely believed that the Saab-210 is a flying scale model for a much larger night and all-weather fighter, to be powered with a new "all-Swedish" axial-flow turbojet of 8,000 lb., or higher thrust.

There are abundant signs that the Swedish industry is determined to retain the advanced technical status conferred upon it by the design and production of the J-29 fighter. Important developments, not only in respect of airframes and power plants, but armament also, are confidently expected.

FRANCE

France's Armée de l'Air has a respectable fighter and fighter/bomber force, composed of de Havilland Vampires, S.N.C.A.S.E. Mistral (Vampire development), Republic F-84E Thunderjets, and piston-engined Thunderbolts and Supermarine Spitfires. At the time of writing none of the Marcel Dassault Ouragan or Mystère fighters, for which orders have been placed, has been delivered.

Although a number of British-built Vampires were supplied to France, the F.B. Mark 5 type has also been built in quantity at the S.N.C.A.S.E. factory at Marignane, near Marseilles. This type, however, has given way on the production line to the Mistral, or Vampire Mark 53, and production of the Sea Venom N.F.20 and Venom F.B.1 is intended. The Mistral represents a considerable advance on the Vampire F.B.5, having a Hispano-built Rolls-Royce Nene in place of the de Havilland Goblin, and an ejector seat. The maximum speed claimed is over 570 m.p.h., and, although the all-up weight has been increased by a few hundred pounds, the rate of climb is good. On test a Mistral is known to have attained a height of 40,000 feet in 9 minutes 45 $\frac{1}{2}$ seconds.

The Marcel Dassault M.D.450 Ouragan is an efficient Nene-powered low-wing monoplane with a maximum speed in the neighbourhood of 600 m.p.h. For the later M.D.452 (Mystère) development the Hispano-built Rolls-Royce Tay is intended, and from this combination a performance in some respects superior to the North American Sabre is forecast. Night and all-weather developments of the type are in prospect.

All bombing equipment now in service is obsolescent. The standard types are the Handley Page Halifax, Martin Marauder, and Mosquito fighter/bomber, and, though twin-jet French prototypes, intended to succeed the Mosquito and Marauder, have been flown, no quantity production has been ordered. Reconnaissance units are still equipped with Lockheed Lightnings, Mosquitos and Mustangs, and it is intended to replace the Mustang in the tactical reconnaissance role by a variant of the Dassault Ouragan.

Languedocs, Halifaxes, Dakotas, Ju 52s and Siebel Si 204s are the most widely employed transport types, but a substantial order has been placed for the efficient twin-boom Nord Noratlas, on Fairchild Packet lines but powered with Bristol Hercules engines constructed in France.

For general-purpose colonial operation the all-metal Dassault M.D.315 Flamant has been put into service in substantial quantities to supplement Ansons and Fieseler Storchs.

A diversity of trainers of British, American, French and Belgian origin continues in service, though a reduction in the number of types is sought.

French naval aviation (l'Aéronautique Navale) operates two types of

deck-landing fighter—the Supermarine Seafire and Grumman Hellcat—and for attack and dive-bombing there are squadrons of twin-engined Bloch 175s, single-engined Curtiss Helldivers and Douglas Dauntlesses. All are obsolescent. A number of Vickers Wellingtons were supplied soon after the war, and, more recently, 54 Avro Lancasters have been acquired. These machines are to operate from North African bases and their equipment is appropriate to maritime reconnaissance duties. Extra tanks have been installed in the bomb bay and A.S.V. search radar has been fitted.

As in the Royal Air Force, the Short Sunderland 5 is the standard flying-boat, but there are also very small numbers of Bréguets and Dornier Do 24s.

ARGENTINA

Though small numbers of piston-engined Fiat G.55 single-seaters remain in service, the standard fighter of the Argentine Air Force is the Gloster Meteor 4, with Rolls-Royce Derwent 5 turbojets. The Meteor has been available in respectable numbers for some years, and as a possible replacement the Instituto Aerotecnico, at Cordoba, designed and built the Nene-engined Pulqui II. This project was supervised by the ex-Focke-Wulf designer and director Kurt Tank, who was responsible for the Fw 190 and other outstanding German fighters, and whose handiwork was manifest in the swept-back wing and tail surfaces.

Though the Prototype Pulqui II crashed while on test and development intentions are uncertain, it is of interest that the machine was designed for a speed of about 650 m.p.h. and for a ceiling of nearly 50,000 feet. It was, in fact, in the class of the Swedish J-29. British practice was followed in the matter of armament (four 20-mm. guns) and there was a further resemblance to the J-29 in that the undercarriage retracted into the fuselage.

In the attack-bomber category Argentina has standardised on the I.Ae.24 Calquin, obviously inspired by the de Havilland Mosquito but resembling even more closely the German Focke Wulf Ta 154 of 1945. Two American Pratt and Whitney Twin Wasp radial engines give this wooden-winged machine a speed of less than 300 m.p.h.—well below the Mosquito's. The built-in armament is four 20-mm. guns and internal stowage is provided for about 1,800 lb. of bombs, for the aiming of which there is a position in the fuselage nose.

It is, perhaps, not widely known that several Avro Lancasters and Lincolns have been acquired from Great Britain and are used not only for bombing but for long-range reconnaissance and transport also. For liaison and observation flying the standard type is the American Piper L-4.

The principal transport machines in use are Vickers-Armstrongs Vikings, Douglas Dakotas, and Skymasters, Bristol Type 170 Freighters, de Havilland Doves, and Airspeed Consuls.

British equipment, in the forms of Percival Prentices (de Havilland Gipsy Queen engine), is also found in the training formations, but the I.Ae.D.L.22 is an Argentine product. This is an equivalent of the Harvard and can be fitted with an I.Ae.16 El Gaucho engine or the British Armstrong Siddeley Cheetah. Additionally there are a few Italian Fiat advanced trainers and American twin-engined Beech AT-11s.

The Naval Air Service of Argentina possesses few warlike machines,

being largely composed of general-purpose Consolidated Catalina flying-boats, a variety of amphibians (including the Supermarine Walrus and American Grumman types) and Bell helicopters. Naval trainers are of various war-time or pre-war design—German and American.

BELGIUM

The piston-engined Spitfire Marks 9 and 14 fighters having disappeared from first-line squadrons, defence is in the hands of Gloster Meteor 4s and 8s, Republic F-84E Thunderjets, and D.H. Mosquito 16s. The Meteor 4s were built in Great Britain but the Mk 8s are being assembled at the Gosselies factory of Avions Fairey from components made in the Gloster and Fokker factories. The Rolls-Royce Derwent 8 turbojets are made by the Fabrique Nationale at Liege, and, apart from a different V.H.F. radio installation, the machines are virtually identical with the R.A.F. version.

The D.H. Mosquito 16 night fighters were British-built and it is believed that they will eventually be replaced by Meteor N.F.11s, developed by Armstrong Whitworth and standardised by the R.A.F. For jet-conversion training the Belgian Air Force uses the dual-control Gloster Meteor 7; other trainers in service are the de Havilland Tiger Moth, Stampe S.V.4b (a Belgian-built machine of somewhat similar characteristics) and the North American Harvard. For transport and communication flying small numbers of Dakotas and Skymasters, Airspeed Oxfords, and D.H. Dominies are available, and Auster 6s are utilised as air observation posts and for liaison work.

BRAZIL

At the time of writing no jet aircraft are serving with the Brazilian Air Force, the standard fighter being the war-time Republic Thunderbolt, while the twin-engined bombers are of North American Mitchell type. Consolidated-Vultee Catalina flying-boats are utilised for patrol and survey work, and standard trainers are of North American, Fairchild and Beech design. In addition to a few Dakotas, there are twin-engined Beech transports.

BULGARIA

The few fighters available to Bulgaria are thought to be of the radial-engined La-5 and piston-engined Yak-9 type. For light bombing the Russian Pe-2 is standard, and a number of Il-10 armoured two-seaters are employed for ground attack. Trainers and such transports as are available are likewise of Russian origin.

CHILE

The Chilean Air Force, like that of Brazil, uses Republic Thunderbolt fighters and North American Mitchell bombers. The whole force, in fact, is equipped with American types, including Catalina flying-boats, Vought-Sikorsky seaplanes, Dakota transports, and North American, Fairchild, Vultee, and Beechcraft trainers.

COLOMBIA

The Colombian Air Force is another of the South American Services to be equipped with Republic Thunderbolt fighters. Additionally, there are a few Dakotas, Catalinas, and Harvards.

CZECHOSLOVAKIA

The fighters in service with the Czechoslovak Air Force are not wholly of Russian origin, for considerable numbers of the Czech-built Messerschmitt Me 109 have been delivered. Though it is believed that jet aircraft are now in use, the only Russian fighter known to be in service is the piston-engined La-7. Light bombers are of the Russian Pe-2 type, and Il-10 armoured ground-attack aircraft have also been made available. Training equipment is a mixture of German and Czech machines. The principal transport is the Junkers Ju 52, but the smaller Siebel Si 204 is also utilised in this role.

DENMARK

The core of the Royal Danish Air Force is composed of squadrons of Gloster Meteor interceptors (Marks 4 and 8), powered with Rolls-Royce Derwent turbojets. For fighter training a number of Spitfire 9s are available, in addition to two-seater (Mark 7) Meteor jets. Patrol and rescue flying falls to the lot of wartime Boeing B-17 Fortresses, Supermarine Sea Otters, and Convair PBY-5A Catalinas.

Piston-engined trainers include recently delivered de Havilland Chipmunks, with D.H. Gipsy Major engine, and Danish-built KZ-2 monoplanes, Airspeed Oxfords, and North American Harvards.

A Danish-designed-and-built air observation post machine, the KZ-10, is powered with an American 145-h.p. Continental engine. This little high-wing monoplane weighs rather less than 2,000 lb. all-up, has a top speed of over 134 m.p.h. and a minimum speed of less than 30 m.p.h. It is among the best of its class.

DOMINICA

Though no jet fighters are in service, the Dominican Air Force has some useful piston-engined machines in its North American Mustangs, de Havilland Mosquitoes and Bristol Beaufighters. A small number of Boeing B-17 Fortress four-engined bombers are also on charge, and for maritime reconnaissance and general purposes Convair Catalina amphibian flying-boats are available. Twin-engined Curtiss C-46 Commandos are the principal transports, and trainers are of Beech, Cessna, Boeing, North American and Consolidated-Vultee manufacture.

ECUADOR

The Ecuadorian Air Force has Republic Thunderbolt fighters, Dakota transports, and various American trainers.

EGYPT

Though at one time Egypt had on order a number of de Havilland Vampire two-seater night fighters, delivery of these never took place. Small numbers of Vampire and Gloster Meteor single-seat fighters were, however, supplied, and a few Meteor 7 trainers were also acquired. The most modern of the piston-engined fighters is the Hawker Fury I, powered by the Bristol Centaurus. During 1950 twenty reconditioned Vickers-Supermarine Spitfire 22s, with Rolls-Royce Griffon engine, were sold to

Egypt, and it is known that a quantity of older Spitfire 9s was already in service at that time. Moreover, from Italy were acquired a few Macchi C.205 and Fiat G.55 single-seaters. Transport types are the Dakota, Commando, and Dove, and for training there are Ansons, Harvards, and Magisters.

ETHIOPIA

Intended primarily for the support of ground forces, the first-line force of the Imperial Ethiopian Air Force is largely equipped with Swedish Saab-17A two-seater dive-bombers, powered with the Swedish-built Pratt and Whitney Twin Wasp engine. The Saab-17 is comparable with the Vultee Vengeance and has a top speed of about 270 m.p.h.; it is said to be well suited to the high-altitude Ethiopian airfields. A later attack machine, ordered from Britain, is the Fairey Firefly Mark 1, powered by a Rolls-Royce Griffon engine and equipped to carry over 2,000 lb. of bombs or sixteen rocket projectiles, in addition to its four 20-mm. cannon. It is understood that the Fireflies were ordered to supplement, and not immediately to replace, the Saab-17s. Additionally, Ethiopia has bought from Sweden a quantity of Saab Safir three-seaters, which are used for training and communications work. For more advanced instructional work American Cessna AT-17s, with Jacobs radial engines, are utilized. Early in 1952 the acquisition of new reconnaissance aircraft and jet fighters was under consideration.

FINLAND

It is believed that the only equipment worthy of military consideration in the Finnish Air Force is a small quantity of Messerschmitt Me 109G fighters. Trainers are Swedish-built.

GREECE

As this article is compiled, no jet aircraft are in service with the Royal Hellenic Air Force, and the only type of fighter available is the Supermarine Spitfire. For dive-bombing and ground attack Curtiss Helldiver monoplanes have been supplied, and these machines are also used for reconnaissance, in addition to North American Harvards and Auster A.O.Ps. The standard transport type is the Douglas Dakota, and Avro Ansons and Airspeed Oxfords are used for communication flying.

GUATEMALA

There is no first-line equipment in the usual sense in the Guatemalan Air Force, the machines available being Dakota transports and various American training aircraft.

HOLLAND

The air-defence element of the Netherlands Army Air Force is equipped with Gloster Meteor 4 and 8 fighters. The Mark 4s are British built, but the Mark 8s are constructed under licence by the Fokker factory at Amsterdam. This factory, incidentally, has also supplied Meteor 8s to the Belgian Air Force. Republic F-84E Thunderjets delivered from America form the equipment of the tactical air force; like those supplied to Belgium,

they have provision for formidable loads of rocket projectiles or bombs. Small numbers of Supermarine Spitfires remain in service.

The principal transport types are the Lockheed 12A and Douglas Dakota, and as an air observation post the British Auster has been standardised. British trainers—Gloster Meteor 7s, Airspeed Oxfords, Avro Ansons, and D.H. Tiger Mother—are much in evidence, though the Army Air Force has also been supplied with the Lycoming-powered Fokker Instructor. The Army Air Force is one of the few, incidentally, using the two-seater Supermarine Spitfire Trainer. Harvards and Beechcrafts are also in service.

The first-line equipment of the Netherlands Naval Air Service is likewise mainly British, comprising Hawker Sea Fury F.51 Centaurus-powered fighter/bombers and Fairey Firefly fighter reconnaissance two-seaters of three different marks—1, 4 and 5. The standard bomber is the North American Mitchell, and for long-range patrol and reconnaissance Convair Catalinas and Lockheed Harpoons were supplied after the war. The most advanced trainer is the two-seater Fairey Firefly, and the Airspeed Oxford serves for training, in addition to being used as a transport.

Of Dutch designs the Fokker Instructor has already been named, and from the same factory come two other trainers, neither of which has been ordered in quantity at the time of writing. These are the S.13 crew trainer, with two piston engines, and the Rolls-Royce Derwent-powered S.14 side-by-side jet trainer—a roomy and promising design.

HONDURAS

Lockheed Lightnings and Bell Kingcobras form the combat equipment of the Honduras Military Air Arm, which also has Douglas Dakotas and twin-engined Beechcraft transports, in addition to various American trainers.

HUNGARY

A few trainers of Russian, German, and Czech origin form the only known equipment of the Hungarian Air Force.

INDONESIA

Mustang fighters, Mitchell bombers, and Dakota transports form the operational equipment of the Air Force of the Republic of Indonesia. The largest type in service is the Consolidated Catalina amphibian, which serves for survey and reconnaissance. Transport flying is, in the main, the role of Dakotas, and Auster and Piper light aircraft are employed as air observation posts and for communication flying. For general duties some Hiller 360 helicopters have been bought from America, and trainers are likewise of American origin.

IRAN

All first-line machines in service with the Imperial Iranian Air Force are of obsolete type. Fighters are the Hawker Hurricane and Republic Thunderbolt, and the Avro Anson serves as a general-purpose machine and for light bombing. Apart from the single-seater Hurricanes, a few dual-control Hurricane trainers were supplied. These, it may be remarked, are in the company of their ancestors, for a few Hawker Hinds

and Audaxes have been retained for training, in addition to de Havilland Tiger Moths.

IRAQ

The Hawker Fury fighter/bomber, powered with a Bristol Centaurus piston engine, is the most formidable machine in the service of the Royal Iraqi Air Force. For transport and communication work de Havilland Doves were acquired, and trainers include Avro Ansons, D.H. Tiger Moths, and possibly a few obsolete Hawker biplanes.

ISRAEL

The fighter squadrons of the Israeli Air Force are armed with North American Mustangs and Supermarine Spitfires. The standard light bomber is the de Havilland Mosquito, and a few Boeing B-17 Fortress four-engined machines form the heavy equipment. Transport units have Curtiss Commandos and Douglas Dakotas, and various American light aircraft are used for liaison, reconnaissance and training. The most recent type of trainer is the Fokker Instructor; the most advanced is the Harvard.

ITALY

Two types of jet fighter—the British de Havilland Vampire 5 and the American Republic F-84 Thunderjet—form the equipment of the first-line fighter squadrons of the Italian Air Force. These are supported by the piston-engined North American Mustangs, Republic Thunderbolts, and Lockheed Lightnings. Eventually the de Havilland Venom two-seater night-and-all-weather fighter, powered with the Ghost turbojets, will be issued to a number of squadrons. This type, which has also been standardised by the Royal Air Force, is being built in quantity at the Fiat works. This same company is building the Ghost turbojet under licence.

From America a small quantity of Curtiss Helldiver two-seater dive-bombers has been delivered for the use of attack units. Transports, apart from a few Douglas Dakotas, are of Italian origin—Fiat G.212s and G.12s, and Savoia-Marchetti S.M.95s and S.M.82s—and for patrol and rescue work a few of the war-time Cant. Z.506B three-engined, twin-float seaplanes remain in use. For communications duties there are the Macchi M.B.308 high-wing monoplane and American Beechcrafts. Trainers include the powerful Fiat G.59, with Rolls-Royce Merlin engine, and the smaller Gipsy Queen-engined G.46, Ambrosini low-wing monoplanes (mainly for aerobatics), and North American Harvards. From Holland a quantity of Fokker Instructors has been delivered, and the licence for the type was purchased. Later, the indigenous Piaggio P.148 was ordered in small numbers.

A notable Italian-designed-and-built jet trainer is the Fiat G.80, powered initially with the D.H. Goblin but adaptable for the more powerful Ghost. No production order has been placed.

MEXICO

Republic Thunderbolt fighters, Douglas Dakota transports, and a few twin-engined and single-engined American trainers and communication aircraft form the equipment of the Mexican Air Force.

NICARAGUA

Lockheed Lightning fighters, Boeing bombers and Douglas transports are the mainstay of the first-line units of the Nicaraguan Army Air Force. The trainers are similarly of American origin.

NORWAY

Until the arrival of a quantity of Republic F-84E Thunderjet fighters from America, fighter squadrons of the Royal Norwegian Air Force were equipped exclusively with de Havilland Vampires (Marks 3 and 52) and Supermarine Spitfire 9s. All these types are now in service together. For fighter/bomber work the D.H. Mosquito 6 is the standard type, and for long-range patrol and reconnaissance there are Convair Catalinas. The principal transport machine is the Douglas Dakota.

PERU

Yet another of the South American air forces equipped with Republic Thunderbolt fighters, the Peruvian Air Force additionally has North American Mitchell and Lockheed Ventura light bombers, Douglas Dakota transports and general-purpose Convair Catalina and Grumman Goose amphibians. The trainers are of American type.

PHILIPPINES

For fighting and ground attack the Philippine Air Force uses the North American Mustang. All second-line aircraft, which include Dakotas and Harvards, are likewise American.

POLAND

The Polish Air Force is exclusively equipped with Russian machines—Yak-9 fighters, Il-2 low-level attack aircraft, Pe-2 light bombers, Li-2 transports, and Po-2 and Ut-2 trainers.

PORUGAL

The Portuguese Army Air Force has Hurricane and Spitfire fighters, Junkers Ju 86 bombers, Ju 52 transports, and Boeing B-17 Fortresses for air/sea rescue work. The transports include Douglas Skymasters as well as Dakotas, and trainers are a mixed bunch of American and British types, including a recently delivered batch of de Havilland Chipmunks.

The Naval Air Service has Grumman amphibians and a small selection of British and American trainers.

SWITZERLAND

The de Havilland Vampire 6, which is the standard fighter of the Swiss Air Force, is one of the "export" models with the Goblin 3 turbojet of 3,300 lb. thrust. It is built under licence in Switzerland and serves as a fighter/bomber alongside the North American Mustangs and a few piston-engined types of Swiss design and construction. The Swiss C.3604 piston-engined monoplane, which serves as a reconnaissance aircraft, is powered with a Hispano Suiza engine and armed with three fixed 20-mm. guns, in addition to twin dorsal machine guns. The maximum speed

approaches 350 m.p.h. For training and communication flying there are German, Swiss, and American types, including Harvards and Fieseler Storchs.

RUMANIA

Obsolescent Messerschmitt Me 109G and Rumanian-built I.A.R. 80 fighters are the most formidable machines of the Rumanian Air Force. There are small quantities of Rumanian, German, Italian, and American transport, reconnaissance and trainer aircraft, including Ju 52s and Savoia-Marchetti S.M. 79s.

SPAIN

The majority of aircraft now in service with the Spanish Air Force are of German design and Spanish manufacture. The standard fighter is an interesting variant of the Messerschmitt Me 109, with the Spanish-built Hispano Suiza 12Z engine driving an imported Swiss airscrew. Considerable redesign was necessary, the original engine having been of German inverted type, whereas the Hispano Suiza is an upright vee. The armament is three 20-mm. guns and the maximum speed in excess of 400 m.p.h.

The standard bomber is the wartime Heinkel He 111P, built in Spain by the C.A.S.A. factory at Getafe with the aid of German jigs and tooling, and the most widely used transport—the elderly, though still useful, Junkers Ju 52—is also C.A.S.A.-built. A few Italian Savoia-Marchetti three-engined low-wing monoplanes are also in service with the transport units. Most widely used of the trainers is the German Bücker Bü 133 (another C.A.S.A. production), but indigeneous types in service are the Hispano Suiza H.A.42B and H.A.43B. These aircraft are advanced trainers, equivalent to the North American Harvard and using the British Armstrong Siddeley Cheetah seven-cylinder radial engine. Also in service is the little I.N.T.A. H.M.1, a counterpart of the de Havilland Chipmunk.

THAILAND

For ground attack and fighting the Royal Thailand Air Force has Supermarine Spitfires and Grumman Bearcats, and for transport, Dakotas and Beechcrafts. In succession to the Miles Magister, the de Havilland Chipmunk has been adopted as a basic trainer and Harvards are used for more advanced work. Indicative of the forward thinking of the staff is the acquisition from America of Sikorsky S-51 and Hiller 360 helicopters.

TURKEY

Formerly equipped exclusively with Supermarine Spitfire and Republic Thunderbolt piston-engined fighters, the fighter force of the Turkish Air Force now has several squadrons of Republic F-84E Thunderjet fighter/bombers. These machines are similar to those in service with the U.S.A.F. and various European air forces. For bombing and ground attack de Havilland Mosquitoes and Douglas Invaders have been supplied, and photographic reconnaissance is undertaken by Spitfire 19s. Douglas Dakotas, Beech Expeditors and Oxfords are standard communications equipment, and the trainers are principally Beeches and North American Harvards.

URUGUAY

Uruguayan military aviation includes the Naval Air Service: thus, ex-United States Navy Grumman Hellcat fighters and Grumman Avenger torpedo bombers are found in service alongside North American Mustangs and North American Mitchells. Transports are mostly Dakotas, Commandos, and Beeches; trainers, similarly, are of American manufacture.

VENEZUELA

To supplement Republic Thunderbolt piston-engined fighters the Venezuelan Air Force has acquired small numbers of de Havilland Vampire fighter/bombers. War-surplus Mitchells are standard bombing equipment, and for transport the Dakota is utilised.

YUGOSLAVIA

In addition to Russian piston-engined fighters of Yak-3 and Yak-9 types, the Yugoslav Air Force has adopted a modified version of the Yak-9, bearing the designation S-49. At the time of writing the hoped-for American jet fighter/bombers have not been supplied. The standard light bomber is the Russian Pe-2, and for low-level attack armoured Ilyushin monoplanes are in service. Transports are of Russian and German type (Li-2 and Ju 52) and trainers are largely Walter-engined Aero tandem two-seaters. Russian Po-2s are also in service.

H. F. KING

REFERENCE SECTION

STATEMENT ON DEFENCE

(Cmd. 8475)

I. INTRODUCTION

1. Just over a year ago the late Government announced a new and greatly expanded rearmament programme, the cost of which (including civil defence) was to be £4,700 million. This programme was to be achieved if possible over the three years April 1951–March 1954 and its object was to enable the United Kingdom to make the maximum contribution, consistent with maintaining its economic strength, to the defences of the free world and so deter possible aggression. More particularly the purposes of the programme were:

- (i) *Navy*.—To build up our anti-mine and anti-submarine forces, including naval aircraft; to modernise existing carriers, cruisers, submarines, destroyers and frigates and to enable us to make our contribution to the North Atlantic Treaty Organisation, while maintaining an active Fleet capable of supporting our policy throughout the world.
- (ii) *Army*.—To build up an Army of the equivalent of 10 active Divisions, 12 reserve Divisions and other supporting units; and to produce modern equipment for the major part of these forces and for Anti-Aircraft Command.
- (iii) *Air Force*.—To increase the front line of the Air Force in all theatres and in particular to expand the forces placed under the Supreme Allied Commander, Europe; to provide it with modern equipment; and to overhaul the radar network of the United Kingdom.

2. The programme was designed as the biggest the United Kingdom could undertake without going over to a war economy. Being a maximum programme it was inevitably susceptible to delays, and by the autumn of 1951 it was apparent that production difficulties would slow down its completion. The rate of progress must also inevitably be affected by the grave worsening of the United Kingdom's balance of payments which has taken place since the defence programme was launched.

3. The object of this White Paper is to take stock of the progress made to date in fulfilling the programme. In succeeding Sections the programme is accordingly discussed under its main headings of finance, manpower, production, and works services. Further Sections deal with co-operation with the other Commonwealth countries and developments in N.A.T.O. and with Civil Defence.

II. FINANCE

4. The £4,700 million programme contained a substantial provision for civil defence to which a brief reference is made in Section VII. Excluding civil defence, the cost of the programme in 1952–53 was originally put at

about £1,500 million net at 1950 prices. The estimate of net expenditure in 1952-53, at current prices, is £1,462 million.* The following table compares the net estimates for 1952-53 with corresponding figures for 1951-52:

		1951-52	Total	1952-53	(£ million) 1952-53 Revised (see para- graph 6)
	Original	Supple- mentary		Estimate	
Admiralty	278.5	Nil	278.5	357.3	332.3
War Office	418.8	10.0	428.8	521.5	491.5
Air Ministry	328.7	1.8	330.5	467.6	437.6
Ministry of Supply	81.5	Nil	81.5	98.5	98.5
Ministry of Defence	6.2	6.0	12.2	17.3	17.3
	1,113.7	17.8	1,131.5	1,462.2	1,377.2

5. A broad analysis of the defence budget under the usual headings is given in Annex II. This budget excludes civil defence expenditure. It also excludes expenditure by the Ministry of Supply on capital assistance to contractors engaged in production and on machine tools. This will amount to about £43 million net in 1951-52 and is estimated at £62 million in 1952-53.

COUNTERPART FUNDS

6. In the table in paragraph 4 the column headed "1952-53 Revised" shows the totals of the estimates reduced by £85 million in respect of sterling "counterpart" arising from economic aid from the United States of America.

7. Counterpart is the sterling equivalent of the United States economic assistance given in the form of grants, *i.e.* excluding assistance given by way of loan or provided in kind as finished equipment ("end items").

8. The United Kingdom has been allotted \$300 million of economic assistance in the United States fiscal year ending June 30, 1952. The grant element in this sum will be dealt with in accordance with Article IV of the Economic Co-operation Agreement of June 26, 1948 (Cmd. 7469), whereby the United Kingdom is required to set aside, in a special account at the Bank of England, sterling equivalent to the dollar value of the grants received. Of this, 5 per cent. has to be made available to the United States Government for administrative expenditure and for certain other purposes. The bulk of the remaining 95 per cent. is to be applied, in agreement with the United States Administration, to meet expenditure on military production, construction, equipment or material. It has also been agreed with the United States Government that this objective shall be attained by appropriating the 95 per cent. in aid of expenditure on the production of equipment for the Services in 1952-53.

9. This use of sterling counterpart reduces the net total of the defence budget but does not affect the real level of the United Kingdom's defence effort. This level has already been determined after taking account of external support, including economic assistance from the United States.

* This net total becomes £1,377 million after allowing for the Appropriation-in-Aid of the sterling equivalent of part of a dollar value of the grants described in paragraphs 6-9.

The object of including counterpart in the defence budget is therefore to emphasise, in accordance with the United States intentions, the purpose for which economic assistance is at present being granted.

INFRASTRUCTURE

10. The United Kingdom, in common with other members of N.A.T.O., has agreed to contribute towards the cost of constructing and developing various military works (such as airfields, communications, and headquarters required, mainly on the Continent, for the common defence of Western Europe. Such installations are commonly known as infrastructure. National contributions are agreed between the participating countries in respect of each of a series of programmes as these are worked out. Thus in 1950 the United Kingdom agreed to contribute £9 million towards an initial (Brussels Treaty) programme costing £33 million. Last year we also agreed to contribute £14 million towards a second (N.A.T.O.) programme costing about £80 million. A further programme is at present under consideration. £12 million for infrastructure is included in the Ministry of Defence estimate for 1952-53.

III. MANPOWER POLICY

11. The Government intend to preserve the basic features of the existing manpower policy, namely:

- (i) maximum recruitment and maximum extension and re-engagement of regulars;
- (ii) two years' full-time national service;
- (iii) maximum recruitment to the Auxiliary and Reserve Forces;
- (iv) maximum economy in the use of Service manpower.

ADJUSTMENTS OF POLICY

12. The following adjustments will be made in the application of this policy in 1952-53:

- (i) In order to increase the number of men available for the forces this year there will be five registrations of young men for National Service instead of the usual four. This is possible because one of the four registrations was dropped in 1948.
- (ii) Providing the international situation allows, the Service Departments intend progressively to release regulars retained beyond their normal term of colour service as the result of the Korean emergency: in the Army and Air Force all such regulars will have been released by September, 1953; in the Navy, it is hoped that the length of retention will be progressively reduced from 1953, but it is not yet possible to state when all retentions will cease.
- (iii) The Army have released all the regular reservists they called back to the colours for the Korean emergency. The Navy will find it necessary to continue to call back small numbers of reservists for service with the Fleet and in 1952-53 up to 3,500 men of the Royal Fleet Reserve will be thus recalled for service.

REGULAR RECRUITMENT

13. An abundant supply of regular recruits is essential to the efficiency and morale of the armed forces. Since the war the Navy, whose recruitment programme is much smaller than that of the Army and Air Force, have obtained most of the recruits they need despite difficulties in certain categories, notably in aircrew. In the Army and Air Force, however, a serious decline in regular recruitment took place between 1947 and 1949. This decline was arrested by the pay increases of September, 1950. In the Air Force, the effect of these pay increases in combination with other improvements in the conditions of regular service, including the three-year engagement and longer service careers, based on a new trade structure, was to give a rate of regular recruitment in 1951 between three and four times that prevailing in 1948 and 1949. In the Army the rate of recruitment between September and December, 1950, was nearly double that in the earlier months of the year, but this improvement was not maintained in 1951 during which year recruiting fell back nearly to the 1949 level. The Army have, however, now introduced a new type of three-year engagement. Present indications are that this is attracting substantially greater numbers.

14. The numbers of male regulars recruited between 1947 and 1951 were as follows:

REGULAR RECRUITMENT						
		1947	1948	1949	1950	1951
Navy ..	..	21,800	19,700	16,300	10,000	10,500
Army ..	..	40,500	33,900	23,800	25,300	26,400
Air Force ..	..	33,300	13,600	12,200	23,600	44,900
Total ..	..	95,600	67,200	52,300	58,900	81,800

15. The maintenance of a satisfactory flow of regular recruits is of course intimately linked with conditions of life in the Services. This important matter is dealt with in paragraphs 29-37.

EXTENSIONS AND RE-ENGAGEMENTS

16. The extension and re-engagement of regulars for long service is second in importance only to initial recruitment, particularly now that a short term of initial engagement has been introduced into the Army and the Air Force. The Services rely on a healthy rate of re-engagement to furnish them with highly skilled tradesmen and experienced non-commissioned officers.

17. Special temporary inducements to attract men to re-engage for pension were introduced in September, 1950, and are being continued in 1952. The effect of these inducements is hard to disentangle from that of the simultaneous improvement in pay. Both factors have undoubtedly played a part and the improved retirement benefits announced in July, 1951, and described in paragraph 37 have provided a further inducement. As a result of these measures there have in general been small but progressive improvements in the rate of re-engagements and extensions since the autumn of 1950. However, the improvements have been by no means spectacular and the situation still gives cause for anxiety.

TREND OF REGULAR STRENGTH

18. On the basis of the trends of recruitment and re-engagement discussed in paragraphs 13 to 17, and in particular the evidence of popularity of the recently introduced short-service engagements of the Army and Air Force, the regular strengths in April, 1952, and April, 1953, are estimated to be as set out in the following table in which the figures for April, 1950, and April, 1951, are added for comparison:

REGULAR MALE STRENGTH

	Actual	(Thousands)		
		April 1, 1950	April 1, 1951	April 1, 1952	April 1, 1953
Navy	122.3	125.6	135.4	133.7
Army	184.3	202.2	209.8	207.8
Air Force	114.7	139.4	173.5	213.0
Total	421.3	467.2	518.7	554.5

19. In the expectation that regular recruiting during the year will show considerable improvement, as mentioned in paragraph 13, it is estimated that the Army will be able broadly to maintain its regular strength in spite of the release of large numbers of regulars who have been held beyond their normal term of colour service as a result of the Korean emergency. (See paragraph 12 (ii).)

NATIONAL SERVICE

20. The number of men estimated to be available from the national service call-up in 1952-53, including about 23,000 additional men through the extra registration mentioned in paragraph 12, is 237,000. A considerable number of these men will, it is estimated, enlist on regular engagements, mainly the recently introduced short-service engagements of the Army and Air Force, before the actual date of their call-up under the National Service Acts. These 237,000 men are to be shared among the three Services as follows:

Navy	7,800
Army	156,000
Air Force	73,200

NUMBERS

21. On the basis set out in the previous paragraphs, the number of men and women with the forces is estimated to be as follows. (The figures for April 1, 1951, are added for comparison):

	April 1, 1951 (Actual)	(Thousands)	
		April 1, 1952 (Estimate)	April 1, 1953 (Estimate)
Regulars	467.2	518.7	554.5
National Service	319.6	314.7	319.0
Women	22.4	23.7	26.9
Total	809.2	857.1	900.4

Table 1 of Annex I shows figures on the basis of this table for each Service.

RESERVE AND AUXILIARY FORCES

22. There has been some improvement in the strength of the voluntary reserve and auxiliary forces in the last year as is shown in Table 2 of Annex I. Many more recruits with previous service experience are, however, still needed.

23. The first national service men called up under the National Service Act, 1948, completed their service with the colours and began to pass into the reserve and auxiliary forces for part-time service at the end of June, 1950. The increase in colour service from one and a half years to two years in October, 1950, postponed the rate of inflow after this first instalment for six months. The inflow was resumed early in 1951 and to date about 152,000 have passed into the reserve and auxiliary forces—8,000 in the Navy, 105,000 in the Army and 39,000 in the Air Force.

24. The number of national service reservists in the reserve and auxiliary forces will reach a maximum in 1954-55. The greatest importance is attached to these men taking on the longer training commitments of the volunteer reserves. So far, the response in the Navy and Air Force has been slow, but in the Army the response, though small as regards the Supplementary Reserve, has been good in the Territorial Army. Of the national service men who have passed into the Territorial Army, over 25 per cent. have joined as volunteers.

TRAINING

25. As already announced, plans have been made to carry out training of Class "Z" and Class "G" Reservists in 1952 on broadly the same lines as in 1951. The period of training, as was the case last year, will be 15 days, and warning notices have already been sent out to all those men who will be needed. No man who has not received a warning notice will be required for training under this scheme this year. The total number of Army Reservists to whom such notices have been sent is of the order of 250,000. The Air Force will be sending notices to 5,500 Class "G" reservists. Some 20-30 per cent. are normally eliminated on medical grounds or grounds of domestic hardship. The numbers expected actually to undergo training are 190,000 in the Army and 4,700 in the Air Force.

26. The training of these Class "Z" and Class "G" men in 1951 and again this year is a major feature of our military planning. For the next few years, together with the members of the reserve and auxiliary forces, these reservists will provide, for the Army the major part of the Territorial or Reserve Army divisions and ancillary units on which we shall have to rely in the early stages of an emergency to support Active Army formations, and for the Air Force much of the Control and Reporting Organisation which is the eyes and ears of the air defence of this country. The training is carried out by the reservist in the great majority of cases with the unit which he would join in an emergency, and these units are thereby enabled to train with adequate numbers and as a team.

STEPS TO COMBAT THE RISK OF INVASION

27. The number of regular formations of the Army serving overseas has risen in fulfilment of our international obligations to a level unpre-

cedented in time of peace. The strength of the forces left in this country has accordingly been reduced to a low level. In order to strengthen our ability to defend ourselves against a sudden descent two important steps have been decided upon by the Government.

- (i) *Formation of the Home Guard.*—The first step decided upon has been to establish the Home Guard on a voluntary and limited basis in time of peace. The necessary Act was passed towards the end of 1951 and men are now being registered for the first units to be raised, those east of a line drawn from Flamborough Head to Selsey Bill to an effective strength and those in the remainder of the United Kingdom to cadre strength.
- (ii) *Use of military establishments for combatant duties.*—The Government have also given directions that the numerous training schools, depots and other establishments of the three Services in this country should acquire a combatant value. This development has greatly increased our ability to defend ourselves against attack.

28. As part of its preparations for guarding our coasts the Navy is establishing a Minewatching Service recruitment for which has recently commenced.

CONDITIONS OF SERVICE

29. Although the life of the sailor, soldier, or airman possesses strong traditional attractions for the youth of the country, the armed forces must move with the times as regards working conditions if they are not to operate at a disadvantage under conditions of full employment. Subject always to the limitations imposed by our economic difficulties the question of living and working conditions in the Services continues to receive careful attention.

ACCOMMODATION

30. The good progress already made in the provision of married quarters at home will be continued in 1952-53. Most of these will be financed under the Armed Forces (Housing Loans) Act 1949. Nearly 8,500 will have been completed by the end of 1951-52. In the coming year about 6,500 houses now under construction will be completed, and it is expected that a further 7,500 will be started. By March, 1953, drawings on the loan are expected to exceed £30 million out of the £40 million which was approved by Parliament for the five-year period 1950-55. At the same time married quarters abroad will continue to be provided in substantial numbers.

RE-SETTLEMENT

31. An intensive drive has been made in the re-settlement of ex-regulars in civilian life, and publicity has been given to the work which is going on. It is clear that recruitment is affected considerably by the attitude of the community towards service in the forces and towards the employment of their members when they return to civilian life. The Advisory Council on the Relationship between Employment in the Services and Civilian

Life has done much to ensure that this attitude is favourable. This Council, which is under the Chairmanship of the Permanent Secretary of the Ministry of Labour and National Service, includes the Second Sea Lord, the Adjutant-General and the Air Member for Personnel, representatives of both sides of industry (including the nationalised industries), Local Authorities, the educational interests, and others concerned.

32. Acting on the ideas discussed on the Council, the Ministry of Labour and National Service, in collaboration with the three Services, has been making approaches throughout the whole field of employment, which are designed:

- (i) to assure to ex-regulars a fair share of the employment available at the time of discharge;
- (ii) to give them an adequate opportunity to enter employment at a level appropriate to their age, experience and ability; and
- (iii) to enable them to enter forms of employment for which they are suitable, but for which, in practice, they have not normally been considered in the past.

Largely as a result of these developments men and women who join the regular forces may be reasonably sure of a satisfactory career on completion of their service.

33. At the present time, there is virtually no unemployment amongst other ranks when they leave the Services. The position of officers is less satisfactory, and much depends upon the recognition by employers that Service officers have qualities and experience which can be of value in the outside world. Determined efforts are being made to bring this about.

CAREERS

34. Fighting is a young man's job, and there can be no general extension of Service careers beyond the age at which a man is fit to serve in any part of the world. Nevertheless, measures have been taken which enable many men to look forward to a long career in the forces.

35. In the Navy there are recently improved opportunities open to ratings of extending their pensionable service to 27 years and 32 years (*i.e.* to an age of 50 years). The Army scheme provides for extensions up to the age of 55, by stages, for suitable men serving on pensionable engagements. The Air Force offer the prospect of a career until the age of 55 for all airmen who have satisfactorily completed their initial four years' service.

36. As regards officers, there is now greater scope for employing Army officers up to 55 in a wide range of staff and administrative appointments, and suitable majors and lieut.-colonels are being given the opportunity of staying in the Service until that age provided they remain fit and efficient. A scheme has been introduced for the employment of retired regular officers in a civilian capacity in certain staff and other posts. In the Air Force also there is a wide range of staff and administrative duties appropriate to officers, beyond the age when they are suitable for full flying duties. Suitable officers are being employed in the Navy and Air Force beyond the normal retiring age in order to meet present needs.

RETIREMENT BENEFITS

37. A further inducement to men to take on a full career in the Services is the assurance of an adequate pension when they return to civil life. Service retirement benefits have been greatly improved in the past year. Increases have been given in Service retired pay and pensions and an entirely new feature has been introduced into the non-effective code in the form of a substantial tax-free terminal grant for re-settlement.

IV. PRODUCTION

38. The £4,700 million programme included about £2,000 million for production at the price level at the end of 1950. This meant that the production element of the annual defence budget would rise at the peak of the programme to over four times the pre-Korean level. It was made clear at the outset that such a programme could be achieved in three years only if the labour, raw materials, machine tools and other manufacturing capacity were available as and where they were needed. It is now clear that these conditions cannot be fully satisfied. Moreover, there have been the inevitable delays in matters of design and production planning which afflict all large arms programmes.

39. Since the programme was started the economic position has seriously deteriorated and severe measures have had to be taken in the civil sector of the economy. About 80 per cent. of defence production consists of products of the metal-using industries which are responsible for about two-fifths of our exports. In the light of this and the other factors mentioned in the preceding paragraph it has been necessary to adjust the defence programme. This adjustment will have the effect of reducing the immediate burden which the programme will place on the metal-using industries. It also means that the programme must take more than three years to achieve.

LABOUR

40. It has become increasingly clear that one of the major difficulties in carrying out the programme is to ensure the supply of the right kind of labour in the right places at the right time.

41. The most serious limitation of the production programme up to now has been the short supply of skilled labour for the initial stages. There may well be increasing difficulty in the supply of unskilled labour where this is needed in areas with competing demands, not only from other essential civil and export production, but also in some cases between different parts of the defence programme. The aircraft programme in particular, which includes several new production lines for jet aero engines, requires the building up of a large labour force. Before the programme started the labour force in the aircraft industry was about 150,000; it is now 177,000 and a further 50,000 will be required by March, 1953.

42. Every effort is being made to secure labour for the re-armament programme. To meet the scarcity of skilled workers industry has been asked to develop schemes of upgrading and training. A Notification of Vacancies Order has been made by the Minister of Labour to come into operation on February 25, 1952. The effect of this measure will be to

reduce undesirable competition between employers for labour and to bring workers who are seeking employment to the Employment Exchanges. This will enable the Ministry of Labour to tell the workers what are the most important vacancies suitable for them and to try to persuade them to go to one of them. In addition a system of labour supply inspection on the lines that proved effective during the war is being revived to assist the administration of the Order.

MACHINE TOOLS

43. The programme requires in all about 35,000 machine tools, almost all of which have now been ordered, either from our own industry or from abroad. Some can be obtained only from the United States. Some we are getting from Europe. Broadly speaking deliveries so far have been satisfactory. Many of the most important and expensive tools, however, are not yet due for delivery.

NEW MATERIALS

44. Although the shortage of raw materials has not been as serious as was at one time expected, it has been and still is in certain directions a matter for concern. The chief raw material needed for the re-armament programme is steel, for which the requirement in 1952-53 is over a million tons. The quantity of finished steel available for United Kingdom consumption in 1951-52 is about 12½ million tons. Hitherto some degree of priority has been secured for defence needs by the use of a "D.O." (Defence Order) symbol. A system of allocation has recently been introduced which will, it is hoped, direct steel to the most essential purposes, especially defence and exports. The defence programme also calls for scarce materials such as copper, zinc, sulphur, nickel, molybdenum, tungsten, and special steels such as stainless steel alloys for jet engines. Certain of these materials are subject to international allocation and we hope that this will ensure that the supplies needed are forthcoming when we want them.

48. In the interests of defence and other essential needs, the use of non-ferrous metals for certain non-essential purposes has been reduced or prohibited.

AMERICAN MILITARY AID

46. Under the Mutual Security Act of 1951 the American Congress has empowered the Administration to continue to provide military equipment to other countries. Military equipment already earmarked for delivery to the United Kingdom forces includes aircraft (Washingtons and Neptunes), anti-tank rocket launchers and an initial supply of rockets, tank transporter tractors, medium and self-propelled guns, and anti-submarine helicopters and specially equipped Skyraider aircraft for the Navy. In addition, we are to receive substantial quantities of spare parts for the maintenance of the main items of equipment we are now receiving, as well as for the maintenance of American equipment already held by our forces. We hope that the United States authorities will succeed in delivering during the next twelve months substantial quantities of the equipment earmarked for the United Kingdom forces.

47. Our requests for further allocations of American military equipment are at present under discussion with the United States authorities.

48. Discussions are also taking place with the United States about the purchase by them of equipment and supplies produced in this country for delivery to N.A.T.O. forces. Such purchases would greatly help to relieve our dollar shortage.

SUPPLY OF FIGHTER AIRCRAFT FROM CANADA AND THE UNITED STATES

49. Arrangements have been made for the supply of a substantial number of F. 86 (Sabre) jet aircraft. Canada will build the aircraft, and the engines and equipment will be furnished by the United States. The aircraft will be manned by the Royal Air Force and will strengthen N.A.T.O. forces.

MAIN FEATURES OF THE 1952-53 PRODUCTION PROGRAMME

50. Aircraft will account for over 20 per cent. of the production expenditure in 1952-53, and tanks and other vehicles for about another 20 per cent. Ammunition, and general (including technical) stores, are the next largest items, accounting for about 25 per cent. of the total between them. Other major items in the programme are warship construction and repairs, clothing, and radio, radar, and signals equipment.

51. The aircraft programme provides many new aircraft of all types, for the Air Force and Navy. Several hundred Centurion tanks fitted with the latest type of armament will be delivered in 1952-3, and the capacity for the large-scale production of modern tanks is being expanded. Many thousands of combat and general service vehicles of the new post-war ranges will also be produced for all three Services.

52. The ammunition requirements resulting from the growing numbers of weapons and increased rates of fire are considerable. The principal items in the 1952-53 programme are anti-aircraft ammunition for all three Services, anti-submarine projectiles and mines for the Navy, aircraft gun ammunition and rockets for the Air Force, and tank and anti-tank ammunition for the Army.

53. The naval programme provides for the completion of about 40 coastal and inshore minesweepers and the acceleration of the construction of 18 anti-submarine frigates and 5 aircraft carriers. Work is also continuing on the modernisation of existing aircraft carriers, cruisers, frigates, and destroyers.

54. Technical developments in all Services have led to greatly increased demands for radar and radio equipment; the conversion of anti-aircraft guns to fully automatic control is an example.

V. WORKS SERVICES

55. The main features of the rearmament works programme are the development and expansion of existing airfields, the rehabilitation of other airfields built during the war and subsequently disused, the air defence system and the provision of covered storage for equipment coming forward

from the expanded production programme. These special services are superimposed on normal minor and maintenance services at service establishments throughout the world.

56. Expenditure by the Service Departments on works services in the current year will be about £90 million. In approving the works programme for 1952-53 the Government have had regard not only to the urgent necessity for economy in public expenditure but also to the shortage of building resources, which has made it necessary to restrict building at home in 1952 to a lower level than had been planned. This restriction has necessarily affected defence building as well as building for the civil economy, and the Government have decided that the provision in Service estimates for works services at home and abroad should not be more than £125 million.

57. Priority has been given in the works programmes for the coming year to the most essential projects. This means that, apart from the married quarters at home which are being built under the Armed Forces (Housing Loans) Act as part of the national housing programme, virtually no provision is being made for new permanent accommodation. Large sums of money will however be devoted to the big civil engineering services involved in the construction of new airfields for modern aircraft: indeed, the Air Ministry provision for works services will be almost three times as great as in 1950-51. Money is also being spent on speeding up the redeployment of Anti-Aircraft Command.

58. There is a very large additional programme of works services required for the United States Third Air Force which is stationed in this country by agreement with the United Kingdom Government. A large proportion of these works services is carried out by the Air Ministry, although a substantial contribution in money, labour and materials is being made by the United States Government.

VI. CO-OPERATION WITHIN THE COMMONWEALTH AND WITH OTHER COUNTRIES

COMMONWEALTH

59. The defence policy of the United Kingdom continues to be based on the closest possible co-operation with other Commonwealth countries and with those of N.A.T.O.

60. A conference of Ministers from Australia, New Zealand, South Africa, and Southern Rhodesia was held in London in June to consider defence problems in regions of common concern, including the Middle East. The defence problems of this area and the related problems of South-East Asian defence were examined in the light of the defence contribution which each of the Governments participating in the conference can make. A continuous exchange of views and information has since been maintained at all levels between the various Governments.

61. The Governments of Australia, New Zealand, and South Africa have accepted the invitation of the United Kingdom, the United States, and French Governments to join with them and other interested Governments in setting up an Allied Command Organisation in the Middle East.

62. Units from the United Kingdom, Canada, Australia, New Zealand, South Africa, and India are serving with the United Nations forces in

Korea, where all the land forces from these countries have been grouped together in the First (Commonwealth) Division. Forces from Australia, New Zealand, and Southern Rhodesia have co-operated with United Kingdom and Colonial troops in measures against bandits in Malaya.

DEVELOPMENT OF THE NORTH ATLANTIC TREATY ORGANISATION

63. So far as the military side of N.A.T.O. is concerned by far the most important event has been the development of the command organisation. General Eisenhower assumed his powers as Supreme Allied Commander, Europe, on April 2, 1951, and during the year Supreme Headquarters Allied Forces in Europe (S.H.A.P.E.) has been built up into a fully organised military headquarters. Subordinate commands for Northern, Western, and Southern Europe have been established.

64. Apart from the establishment of S.H.A.P.E., there have been other important developments in the N.A.T.O. command organisation. The Atlantic Command arrangements were finally approved as the result of the Prime Minister's discussions in Washington with President Truman. Under these arrangements, an American Admiral will be Supreme Allied Commander, Atlantic, with a British Deputy. A British Admiral, responsible to the Supreme Commander, will command the area of the Eastern Atlantic. His instructions will enable him to support adjoining Commands and special steps have been taken to ensure that his activities are co-ordinated with those of the British Commander-in-Chief, Home Station, who will of course be directly responsible to the Admiralty in London. A British Air Officer, who is to be the Air Officer Commanding-in-Chief, Coastal Command, will be the Allied Air Commander-in-Chief in the Eastern Atlantic.

65. Military measures recently agreed by members of N.A.T.O. also include provision for an Allied Naval and Maritime Air Command of an area embracing the Channel and Southern North Sea. An Allied Commander-in-Chief, acting in conjunction with an Air Commander-in-Chief, is entrusted with the overall conduct of operations in the area. The Commander-in-Chief, Portsmouth, is to be the Allied Commander-in-Chief, Channel. The Allied Air Commander-in-Chief in the area is to be the Air Officer Commanding-in-Chief, Coastal Command.

66. In the political sphere, the most important event has been the adherence of Turkey and Greece to the North Atlantic Treaty Organisation. This was formally approved by the North Atlantic Council in Ottawa in September subject to the necessary confirmation by the legislatures of the various North Atlantic Powers, a process which is now complete.

WORK OF THE TEMPORARY COUNCIL COMMITTEE

67. At its meeting at Ottawa in September, 1951, the North Atlantic Council set up a Temporary Committee to consider how the military requirements for the defence of the North Atlantic area could be reconciled with the "politico-economic" capabilities of the N.A.T.O. countries. This Committee (the T.C.C.) has put forward a plan for the build-up of collective, balanced N.A.T.O. forces during the next few years, and its

report is now being considered by the Council at Lisbon. The United Kingdom Government welcomes this report and is confident that it provides a basis for building up a greatly increased deterrent to aggression. It has been recognised by the T.C.C. that the defence programmes of member countries must be subject to regular review in the light of changing military and economic conditions and it is proposed that N.A.T.O. should undertake such reviews annually, the first to be completed this year.

VII. CIVIL DEFENCE

68. The problems of civil defence are very different from those of the armed forces. The main objects of a civil defence organisation are to reduce casualties, to attend to the needs of those who are injured or have lost their homes, to maintain order and to fight fires, to keep essential services going and to sustain morale. In war large numbers of men and women, both whole-time and part-time, are required to serve these purposes, but in peace it is not possible to maintain standing whole-time services other than the ordinary civilian services such as the police, fire, and health services. A start has been made with the enrolment and training of part-time volunteers to assist the existing services and to serve as the nucleus of new services which would be required in war and the rate of recruitment has steadily increased since July, 1950. The other multitudinous measures of civil defence involve for the most part physical preparations; good progress has been made in plans for these measures, but it has not been thought right to devote any large part of our resources to physical preparations. A beginning has also been made with a programme for the procurement of civil defence stores and equipment. All these measures will be further developed on the same lines in 1952-53.

ANNEX I

TABLE 1—ANALYSIS OF UNIFORMED MANPOWER

	April 1, 1951 (Actual)			April 1, 1952 (Estimate)			April 1, 1953 (Estimate)		
	Navy	Army	Air	Force	Total	Navy	Army	Air	Total
Regular	125.6	202.2	139.2	467.2	764.0	135.4	209.8	173.5	518.7
National Service	7.2	223.5	88.9	319.6	425.6	4.4	224.3	86.0	314.7
Women	5.4	7.5	9.5	22.4	43.4	5.3	7.9	10.5	23.7
Total	138.2	433.2	237.8	809.2	145.1	442.0	270.0	857.1	145.4

TABLE 2—STRENGTH OF THE VOLUNTEER RESERVE AND AUXILIARY FORCES

	Strength January 1, 1951			Strength January 1, 1952			Strength January 1, 1953		
	Total volunteers	Normal volunteers	N.S. volunteers	Total volunteers	Normal volunteers	N.S. volunteers	Total volunteers	Normal volunteers	N.S. volunteers
Royal Naval Reserve
Royal Naval Volunteer Reserve	2,801	3,062	—
Royal Marine Forces Volunteer Reserve	6,699	7,962	325
Royal Marine and Women's Royal Army Corps (T.A.)	596	831	47
Supplementary Reserve	93,198	83,496	17,465
Royal Auxiliary Air Force and Women's Royal Auxiliary Air Force	2,140	5,966	173
Royal Air Force Volunteer Reserve and Women's Royal Air Force Volunteer Reserve	7,720	8,123	330
							10,433	11,660	445
									12,105

ANNEX II
DIVISION OF THE DEFENCE BUDGET UNDER THE PRINCIPAL HEADINGS

Financial Year, 1952-53

1	2 Admiralty		3 War Office		4 Air Ministry		5 Ministry of Supply		6 Ministry of Defence		7 Totals	
	Gross	A. in A.	Gross	A. in A.	Gross	A. in A.	Gross	A. in A.	Gross	A. in A.	Gross	A. in A.
1. Pay, etc., of Service Personnel	52.47	0.41	52.06	126.20	16.40	109.80	89.77	2.52	87.25	2.60	—	2.05
2. Pay, etc., of Reserve, Territorial and Auxiliary Forces and grants for administration, etc.	1.46	—	1.46	14.86	0.16	14.70	1.78	—	1.78	—	—	—
3. Pay, etc., of Civilians .. .	40.32	1.13	39.19	53.53	1.85	51.68	32.06	2.04	30.02	11.79	—	11.79
4. Movements .. .	8.88	0.45	8.43	29.55	0.25	29.30	12.33	0.43	11.90	—	—	0.25
5. Supplies—	23.21	4.23	18.98	12.03	1.97	10.06	45.75	3.40	42.35	1.02	1.02	0.01
(a) Petrol, oil and lubricants	11.93	2.32	9.61	41.61	9.60	32.01	18.52	0.90	17.62	—	—	0.01
(b) Food and ration allowance	3.99	0.03	3.96	5.32	1.47	3.85	6.47	1.40	5.07	0.89	0.89	0.01
(c) Fuel and light .. .	0.74	0.46	0.28	2.22	0.24	1.98	1.36	0.20	1.16	—	—	0.14
	39.87	7.04	32.83	61.18	13.28	47.90	72.10	5.90	66.20	1.91	1.91	0.15
6. Production and research .. .	210.72	22.54	188.18	234.00	18.00	216.00	215.50	24.50	191.00	543.80	486.53	57.27
<i>Production and research, providing for the appropriation in-aid of counterpart funds.</i>	210.72	47.54	163.18	234.00	48.00	186.00	215.50	54.50	161.00	543.80	486.53	57.27
7. Works—	17.67	0.75	16.92	34.97	5.25	33.75	81.52	10.80	73.24	24.90	12.05	0.15
(a) Works .. .	0.98	0.50	0.48	4.03	5.50	—	5.40	5.40	—	0.01	—	—
(b) Rents .. .	2.15	2.15	—	—	—	—	—	—	—	—	—	—
(c) Loan quarters .. .	—	—	—	—	—	—	—	—	—	—	—	—
(d) Repayment of sums issued under the Armed Forces (Housing Loans) Act, 1949 .. .	0.02	—	0.02	0.25	—	0.25	0.40	—	0.40	—	—	—
	20.82	3.40	17.42	44.75	10.75	34.00	89.84	16.20	73.64	24.91	12.05	0.15
8. Miscellaneous effective services	3.95	1.37	2.58	4.97	3.57	1.40	3.59	1.46	2.13	—	2.37	0.04
9. Non-effective charges .. .	15.26	0.16	15.10	16.93	0.21	16.72	3.87	0.15	3.72	—	—	—
10. Totals before appropriation-in-aid of counterpart funds .. .	393.75	36.50	357.25	585.97	64.47	521.50	520.84	53.20	467.64	585.01	486.53	98.48
11. Totals providing for the appropriation-in-aid of counterpart funds .. .	393.75	61.50	332.25	585.97	94.47	491.50	520.84	83.20	437.64	585.01	486.53	98.48

• Includes the cost of development work undertaken by industry under contract, and the purchase of stores and equipment for research and development establishments.
† To avoid double counting of payments by the Service Departments to the Ministry of Supply the cross totals of columns 2-6 have been reduced by £76.85 million.

STATEMENT OF THE
FIRST LORD OF THE ADMIRALTY EXPLANATORY
OF THE NAVY ESTIMATES, 1952-53
(Cmd. 8476)

THE estimates which I present for 1952-53 provide for a net expenditure of £357,250,000, which is £78,750,000 more than the sum voted for 1951-52. Since these estimates were prepared, however, agreement has been reached with the United States Government on the application to defence expenditure of sterling counterpart funds arising from the grant of economic aid to the United Kingdom, as explained in the "Statement on Defence, 1952." It is estimated that the sum to be allocated from such counterpart funds in aid of naval expenditure will be £25,000,000, and I will shortly present a revised estimate providing for this sum to be taken as an additional appropriation in aid, the effect of which is to reduce the net grant required to £332,250,000.

The supplementary estimate for 1951-52, which I am presenting concurrently, shows that the expenditure on naval services is likely to exceed the gross provision in the estimates for that year by £3,000,000, although this sum can be more than met by additional receipts accruing during the year.

For 1952-53, additional provision is needed for the expanding rearmament programme and for the maintenance of the Fleet at a higher level of preparedness. It will be appreciated also that account has had to be taken of higher prices and increases in the pay of civilian staff. It is, however, my intention to effect such administrative and other economies, and reductions in overseas expenditure, as is consistent with maintaining the traditional efficiency of the Royal Navy.

Vote A provides for a maximum strength of 153,000, including 5,475 for the Women's Royal Naval Service, and 225 for the Queen Alexandra's Royal Nursing Service. It also includes men and women on release leave, not expected to exceed 2,200 at any time during the year, and 3,300 ratings entered for local service on foreign stations. Officers and men retained beyond their normal period of service, or recalled from the reserves to meet the requirements arising from increased preparedness of the Fleet, are also included. It will be necessary to recall some 3,500 additional Royal Fleet Reservists as well as some officer reservists during the year, and also to continue to retain time-expired ratings and certain officers, but it is my earnest hope that it will become possible progressively to reduce the length of retention from 1953.

During the course of 1951-52 a substantial number of vessels for mine-sweeping and seaward defence duties, and a number of coastal craft, were added to the original new construction programme, and the necessary provision for that financial year has been made in the supplementary estimate now presented. For the year 1952-53 I propose to continue

with a further programme of new construction of these vessels and of a number of harbour defence and miscellaneous craft. Further information will be found on pages 392-93.

The total provision for production and research in the present estimates is approximately £188,000,000 net, compared with some £132,000,000 net in the original estimates for the current financial year. As in previous years, allowance has been made for possible underspending on contract work, etc.

J. P. L. THOMAS

SOME NOTES ON NAVAL ACTIVITIES AND ADMIRALTY POLICY

THE FAR EAST

H.M. Ships have continued to play a full and prominent part in the United Nations' operations in Korea in support of the Security Council's resolutions. In the present financial year they have included :

- 3 Cruisers
- 2 Aircraft Carriers
- 7 Destroyers
- 10 Frigates
- 1 Aircraft Maintenance Carrier
- 1 Headquarters Ship

and a number of supporting vessels.

The 41st Independent Commando Royal Marines, which had served with distinction in Korea since the latter part of 1950, was withdrawn in January, 1952, and has now been disbanded. This Unit was formed to conduct small-scale operations against enemy-held coastlines. For the most part the Commandos have served with the First Marine Division of the United States Marine Corps and they took part in the memorable fighting withdrawal from the Chosin Reservoir. The United States Commander of the naval forces in the Far East paid high tribute to the Unit when it left his command.

The 3rd Commando Brigade, which was sent at short notice from Hong Kong to Malaya in June, 1950, has continued to be responsible for the maintenance of law and order in the State of Perak.

THE MIDDLE EAST

PERSIAN GULF

Naval forces in the Persian Gulf were strengthened in 1951 in order to afford protection to British residents in Abadan. Throughout the negotiations with the Persian Government, H.M. Ships stood by in very trying weather and the final evacuation of Anglo-Iranian Oil Company employees from Abadan was carried out by H.M.S. Mauritius.

EGYPT

On October 16, 1951, the Egyptian Government claimed to abrogate the Anglo-Egyptian Treaty of 1936. On the following day H.M.S. Gamba arrived in the Canal Zone to ensure the flow of traffic through the Suez Canal. Owing to the defection of Egyptian labour, the assistance of the Royal Navy has been needed for mooring and unmooring merchant ships awaiting their turn to pass through the Canal. Up to the end of January, 1952, the Royal Navy had assisted some twenty million tons of shipping to pass through the Canal.

ASSISTANCE TO THE ARMY

Twice during the year aircraft carriers have been used to transport Army Units to the Middle East. In June, H.M. Ships Warrior and Triumph carried the Parachute Brigade to Cyprus and in November, H.M. Ships Illustrious and Triumph took the major part of the 3rd Infantry Division to Cyprus and the Canal Zone.

STRENGTH OF THE FLEET

The table below shows the strength of the Fleet in classes (excluding vessels of the fleet train, attendant ships and numerous small craft).

	Active Fleet	Training and experimental (Special complements)	In Reserve, reducing to Reserve	In course of construction*
Battleships	—	Vanguard (a)	Anson Howe Duke of York King George V	—
Fleet Carriers	Eagle Indomitable	Indefatigable Implacable Illustrious Triumph Vengeance	Victorious (b) Formidable	1
Light Fleet Carriers	Theseus Glory Ocean		Warrior (b)	7 (c)
Escort Carriers	—		Campania	—
Cruisers	12	—	12	3
Destroyers	31	13	66	6
Frigates	36	19	110	9
Fast Minelayers	2	—	1	—
Monitors	—	—	2	—
Submarines	39	—	14	—
Minesweepers :				
Ocean	24	3	35	—
Coastal	18	12	46	30
Inshore	4	—	4 (d)	35

NOTES

* Work on some ships temporarily suspended (for details see Navy Estimates 1952-53, pp. 245-246).

(a) Refitting. Was intended for the cruise of His late Majesty.

(b) Modernising.

(c) Excludes one building for Australia.

(d) Excludes those earmarked for minesweeping but not yet fitted as such.

TRANSFER OF H.M. SHIPS TO OTHER NAVIES

There have been no transfers of ships to Commonwealth navies during the financial year 1951-52. The following ships have been transferred to member countries of the North Atlantic Treaty Organisation during the past year:

Two minesweepers were sold to Belgium as part of an agreement made in 1949 and two more have yet to be delivered.

The light fleet carrier Colossus, which had previously been on loan, was sold to France; three submarines were lent to France and one more is refitting prior to loan.

In addition two landing craft (assault) were sold to Jordan.

CO-OPERATION WITH COMMONWEALTH AND ALLIED NAVIES

Joint exercises with the navies of Commonwealth and North Atlantic Treaty countries have not become a normal and essential part of naval activity and ensure that the Fleets are fully trained to play their part together in active operations. There was a greatly increased number of these exercises last year of which the following, in each of which navies of several countries took part, are examples:

“Progress”—a tactical exercise conducted by the French Navy.

“Velox”—a convoy exercise conducted by the Royal Navy.

“Factotum”—a minesweeping exercise conducted by the Royal Netherlands Navy.

“Beehive”—a Mediterranean convoy exercise conducted jointly by the Royal Navy and the United States Navy.

Canadian ships took part in exercises in the Mediterranean and ships of the Indian, Royal Pakistan, and Royal Ceylon Navies joined ships of the Royal Navy for joint exercises off Ceylon.

The R.A.N. aircraft carrier Sydney took the place of H.M.S. Glory in Korean waters.

COMMISSIONING BASES FOR SMALL CRAFT

The B.O.A.C. flying boat base at Hythe and the M.T.B. base, H.M.S. Hornet at Portsmouth, are being converted into what are called “commissioning bases” to accept into service the numbers of small craft (Fast Patrol Boats, etc.), which are now being built for the Royal Navy. At these bases, small craft are to be equipped to carry out their equipment trials; thereafter the greater number of them will be maintained in reserve.

The maintenance in reserve of large numbers of wooden craft is a novel problem for the Royal Navy in peacetime and these commissioning bases provide the most practicable and economical solution.

ROYAL NAVAL MINEWATCHING ORGANISATION

As announced on January 11, 1952, it has been decided to raise a corps of volunteers who will, in war, be prepared to look out for the fall of mines from enemy aircraft in our major ports and estuaries.

At least 30,000 mine watchers, of whom more than half will be full time volunteers, will be situated at suitable points on the coast or afloat in the

estuaries and approaches to the ports and, having been given instruction in the use of suitable equipment, they will "pinpoint" the place where any mine is seen to drop. This will greatly facilitate the clearance of the mine and also will enable merchant shipping to be diverted speedily from the danger area.

LOSS OF H.M. SUBMARINE AFFRAY

The Admiralty regret to record the loss of H.M. Submarine Affray on April 17, 1951, while on a practice war patrol in the English Channel. Ships of the United States, French, and Belgian Navies assisted H.M. ships and naval aircraft, and aircraft of Coastal Command in a full-scale sea and air search until the evening of April 19, when the Board of Admiralty announced, with the deepest regret, that there was no reasonable hope of the rescue of any survivors.

Until June 14, when the Affray was found lying on the sea bed in 288 feet of water, all available resources were deployed in an asdic search and she was eventually identified by means of underwater television. Thereafter, for the next four months, H.M.S. Reclaim (the deep-diving vessel) was employed, whenever tides and weather permitted, in examining the hull in an attempt to establish the cause of the loss. As already announced to the House of Commons on November 14, 1951, there was insufficient evidence to establish with certainty the cause of this tragic disaster in which 75 valuable lives were lost.

NEW CONSTRUCTION AND CONVERSION OF H.M. SHIPS

GENERAL

1951-52 was the first complete financial year of the rearment programme and, although the tempo had been quickened when the year began, much preparatory work remained to be done. Progress during the earlier part of the year was concentrated on completing designs and placing orders. The build-up of production has been rapid, though it has fallen short of what was originally planned; in addition to all the usual problems which beset the early stages of a rearment programme, there has been the shortage of raw materials—particularly steel—and the difficulties inherent in introducing a rearment programme into industries already fully employed. Taking all these factors into consideration, progress on the naval programme has not so far been unsatisfactory, but the stage is now being reached where a considerable increase of manpower on naval work in the shipbuilding yards will be necessary to maintain progress.

POLICY

Particular attention is being given to the need to build up anti-submarine and minesweeping forces and to the expansion of naval aviation. The Royal Dockyards will be used to the limit of the labour force available but it will be necessary to continue to rely on private industry for a part of the programme of modernisation and conversion, as well as for a proportion of repair and refit work. Some orders for new construction, e.g. some of the new type of minesweepers, have been placed with firms not normally used for naval work.

NEW CONSTRUCTION

The financial year 1951-52 sees the completion of the new fleet carrier Eagle and the destroyers Daring and Diamond. These ships were laid down long before the rearmament programme. Work will continue during 1952-53 on the other large warships also belonging to past programmes, i.e. a second fleet carrier, Ark Royal, four light fleet carriers of the Hermes class and the remaining six Daring class destroyers, most of which are nearing completion.

Even the smaller ships take a long time to build when compared with other weapons of war and it is far too early to expect the fulfilment of a large part of the rearmament programme in terms of finished ships. The Darings and the carriers mentioned above are being pressed forward as quickly as resources allow, though the completion dates of some of the carriers have been delayed slightly to allow for the installation of flight deck equipment which will be considerably in advance of anything so far in service.

The new ships of the rearmament programme are principally frigates and minesweepers.

The frigates are of a number of differing types corresponding to the duties required of them. The greater part of the frigate programme consists of anti-submarine frigates of two types of different striking power. These will be complementary to each other and the simpler vessel will be produced in larger numbers for the same expenditure in resources. The anti-submarine frigates will be equipped with the very latest developments in anti-submarine weapons. Two frigates are being built in H.M. Dockyards.

A large number of new design minesweepers has been ordered and many are already on the stocks. The first from each of a number of shipyards should be completed before the end of the financial year 1952-53.

A number of fast patrol boats has been ordered incorporating a new design of diesel machinery, which for its power is the lightest unit so far designed. Until these engines are ready a number of craft of an older design are being built and will be finished shortly. In addition, two experimental boats are nearly finished and from these it is expected that much valuable experience will be gained for the future.

Work is proceeding on a new design of vessel for seaward defence and the first of these vessels should be completed during the year.

Development of the new type of fast submarine is continuing satisfactorily and, in addition, a number of an interim type, with a better performance than any predecessor, will be built.

A small hospital ship will shortly be laid down which will take about two years to build; this vessel will, in peacetime, be a Royal Yacht for H.M. the Queen, but it will be so designed that it can be used as a hospital ship in time of war.

MODERNISATIONS AND CONVERSIONS

The modernisation of existing ships and the conversion of others to a new role is an important part of the rearmament programme. A large amount of the modernisation and conversion work will be handled by the

Royal Dockyards though, as stated above, it will be necessary to place a good deal of the work with commercial yards.

Work continues on the modernisation of H.M.S. Victorious at Portsmouth, which when finished will be practically a new ship. The light fleet carrier Warrior will shortly be taken in hand for a less extensive modernisation.

Work on the modernisation of the cruisers Birmingham, Newcastle, and Newfoundland is nearing completion.

The main purpose of the conversion programme is to turn fleet destroyers into fast anti-submarine frigates and thus provide a speedy supplement to the anti-submarine new construction programme. The first of these converted destroyers, H.M.S. Rocket and H.M.S. Relentless, are in service with the fleet. Work is proceeding on further vessels and more will follow during the year. The first ship of a simpler form of conversion, H.M.S. Tenacious, is also in service with the fleet and she will be followed by other ships now in hand.

Work on two existing submarines has resulted in a material improvement in their underwater speed and in other qualities, while others are in hand.

Nearly all the Reserve Fleet ships have had one refit since they were last in service.

STANDARDISATION*

Work on international standardisation, particularly in tripartite discussion with the United States Navy and Royal Canadian Navy, has continued steadily during the year. So too has standardisation within the naval service itself and with the other Forces of the Crown; in both spheres it has proved possible to continue to effect a reduction in the varieties of stores.

An important feature of material standardisation during the past year has been the Anglo-American Conference on the unified screw thread at the British Standards Institution. Further agreements were reached and unified screw thread is now being used in certain designs of armament.

Much effort has been put into the standardisation of drawing office practice. It will, of course, be appreciated that the demands of the rearmament programme for technical staff have to some extent curtailed the effort which has been devoted to the mass of technical work required for material standardisation.

STORES AND EQUIPMENT

Deliveries from the orders placed when the rearmament programme was begun are now coming forward in increasing quantities. The rearmament programme has created a very big demand for stores and equipment and the accumulation of stocks against the possibility of an emergency will take longer than was foreseen last year.

The accumulation of gear for the protection of the merchant fleet in war will also take longer but the opportunity is being taken to fit some merchant ships with certain gear when they come into the yards for repairs.

* *Vide "Brassey," 1950, p. 79.*

NAVAL AVIATION

Naval aircraft have continued to take a prominent part in the hostilities in Korea in support of the United Nations naval and land forces. During the earlier part of the year they operated from H.M.S. Theseus and H.M.S. Glory, the latter being relieved in September by the Royal Australian light fleet carrier, H.M.A.S. Sydney. Although all three of these ships are only light fleet carriers, their contribution to the success of operations has been considerable on account of the intense and sustained flying which they have carried out and which has earned them much praise.

During the past year the most modern of our fleet carriers—H.M.S. Eagle—has been commissioned. The re-equipment of our air groups with jet squadrons has proceeded and the front line air strength of the Navy has been appreciably increased. The modernisation of our naval air stations has continued, including the extension of runways and the improvement of radio aids in order to provide for the operation of the new types of aircraft to be delivered.

Two of our aircraft carriers are now equipped with helicopters for search and rescue duties. A number of special radar equipped aircraft have been received as military aid from the United States. A much improved steam catapult has been successfully developed which, when fitted, will enable carriers to operate the future heavier and faster types of aircraft. H.M.S. Perseus is at present visiting the United States for the purpose of carrying out trials with this steam catapult with the co-operation of the United States Navy.

A fifth R.N.V.R. air squadron has been formed and is based on the naval air station at Ford, Sussex. One of the R.N.V.R. air squadrons paid a visit to a Netherlands naval air station during the summer.

While the Royal Netherlands Navy's carrier Karel Doorman (formerly H.M.S. Venerable) was refitting, the Royal Navy undertook the training of her fighter and anti-submarine squadrons. This training lasted throughout 1951 and included participation in the summer and autumn cruises of the Home Fleet.

A naval night fighter squadron took part in the chief R.A.F. exercise of the year, exercise "Pinnacle."

RESEARCH AND DEVELOPMENT

PROGRAMME PLANNING

The Royal Navy must have weapons capable of offensive and defensive roles in the face of the increased tempo with which a war of the future would be fought. The provision of these weapons is throwing a heavy load on the Navy's research and development resources, and skill is required in planning the programme to ensure that equipping the Navy with modern weapons is kept within our limited manufacturing resources and within our ability to train adequate numbers of officers and men in the operation and maintenance of these weapons.

MINE COUNTERMEASURES

More-efficient sweeping gear for dealing with the various types of mine is being developed.

SUBMARINES

All possible means of submarine propulsion are under investigation, including systems using nuclear energy and oxygen bearing fuels. Every effort is being made by naval scientists to solve the increasing number of complex problems which arise in providing adequate standards of comfort and habitability.

ANTI-SUBMARINE MEASURES

Fast frigates, to seek out and destroy enemy submarines, are required and, here again, new types of propulsive equipment are being developed in order to acquire the necessary superiority in speed. Detection and location equipment which will be effective against the snorkling and submerged submarine is also being developed and new weapons of the ahead thrown type are being studied, which will be more flexible and accurate in use and more deadly in action than any that have previously been used. New types of anti-submarine aircraft with improved radar and sonobuoy equipment are under development. Another anti-submarine weapon which is being developed for use by aircraft as well as by ships is a torpedo which will seek out and destroy its target whatever evasive measures are taken.

AIR ATTACK

For offensive use in fleet actions and for the protection of convoys from air attack, new and faster naval aircraft are being produced which, with their parent aircraft carriers, will be fitted with radar equipment, enabling accurate interception to be made at effective ranges from the surface vessels.

To deal with those enemy aircraft, which succeed in penetrating these defences, new gunnery systems of greater range, accuracy, and destructive power are being worked out and gun and gun direction equipment, which will provide the merchant ship herself with an effective defence, are being progressed. It should be noted that the Admiralty are also responsible for meeting the requirements for fire control equipment for the Army and new systems are at present under development for light and medium anti-aircraft guns.

The most promising weapon in the anti-aircraft armoury will undoubtedly be the guided weapon, capable of engaging the enemy at ranges between that at which our fighter aircraft and our anti-aircraft guns can operate. Naval work on guided weapons is closely integrated with the whole programme of guided weapons development for the defence of the United Kingdom.

SHIP CONSTRUCTION

Research in the various fields of naval construction has enabled us, with confidence, to design ships' structures to closer margins of strength than would otherwise be possible; also lighter materials have been embodied in the designs of ships' structures where this has been found to be advantageous. The saving in hull weight resulting from these improvements has been used to increase the fighting efficiency of H.M. Ships. Researches in the hydrodynamical field have led to improvements in propulsive efficiency, in ability to manoeuvre, and in better sea-keeping qualities.

MARINE ENGINEERING

Good progress continues to be made in the development of high performance steam, light weight diesels, gas turbines for warship propulsion and in parallel design for auxiliary machinery. The aim here is to obtain the greatest efficiency in performance for a minimum of weight and space and a maximum economy in fuel consumption.

VALVES

The Admiralty is responsible for financing and co-ordinating valve research and development for all the defence Services. In this field particularly, great efforts are being made to combine robustness with maximum efficiency. This most important inter-service work makes a substantial demand on the resources available to the Navy for research and development.

OPERATION AND MAINTENANCE OF EQUIPMENT IN CURRENT USE

Efforts are constantly being made, not only in connection with new equipment under development, but with equipment already in service at sea to ease the problems of operation and maintenance. Much help in this direction is provided by the Medical Research Council and the many psychologists, anatomists, and physiologists who are available to advise our scientists. The appointment last year of a scientist as a seagoing scientific adviser to the Home Fleet, which again has the object of getting a closer integration of science and naval practice, is producing valuable results; it is hoped to extend this experiment.

NAVAL PERSONNEL

OFFICERS

An immediate and substantial number of additional experienced officers has been needed, as a result of the measures taken to increase the preparedness of the Fleet. The retention for eighteen months of certain categories of officers, who have completed their normal period of service, has continued throughout the past year. In addition, there has been a good response to the call for volunteers from the Emergency and Retired Lists and the reserves, for eighteen months' active service. These measures for retention and recall for eighteen months will be continued. Some of the officers concerned are being given permanent commissions and, in order to assist in obtaining the further numbers of officers which will be needed, an additional period of from eighteen months to three and a half years' service on normal terms is being offered to many of the officers retained or recalled.

NAVAL PILOTS AND OBSERVERS

The recruitment of naval pilots and observers has improved considerably during the year without, however, meeting the full requirement. A substantial number of young men of good education and physique are still required to fly in the Royal Navy.

As an experiment, regular ratings are now allowed to apply for short

service commissions of eight years and National Service officers may also volunteer for short service commissions. During the past year, a number of ex-naval pilots and observers have been re-entered and there are further vacancies for these already trained or part trained officers. Permanent commissions may be given up to 20 per cent. of the eight years' short service officers who complete their engagements and of the re-entered pilots and observers who complete four years' service.

A generous offer by the United States Navy to undertake part of the pilot training has recently been accepted.

RATINGS

The expansion of the Fleet has made it necessary to continue the retention of ratings beyond the expiration of their normal engagements in order to provide the additional numbers required and, in addition, approximately 5,000 Royal Fleet Reservists were recalled by the end of 1951. It must be remembered that the Royal Navy requires for its expansion a far larger proportion of senior and experienced men than do the other two Services. It is hoped that it will be possible progressively to reduce the length of retention from 1953. In the present uncertainty about the development of the international situation, it is impossible to state when the policy of retaining time-expired men can be abandoned. Releases of retained and recalled ratings on completing eighteen months' additional service started recently. Retentions of ratings will continue in the forthcoming year and up to 3,500 further Royal Fleet Reservists will be recalled for a maximum of eighteen months' service. Recalled ratings are being given the opportunity to volunteer to remain in the Navy for a total of five or seven years from the date of their recall, with opportunities to re-engage for further service at the end of that time.

RE-ENGAGEMENTS

A high rate of re-engagement to complete time for pension is essential, if the Navy is to have adequate numbers of senior ratings. The new pay code, the re-engagement bounty, and the revised pension code announced in 1951 have contributed to an encouraging improvement in the re-engagement rate. The greater opportunities for long service careers in the Navy in future recently announced to the Fleet will, it is hoped, also help to promote re-engagement. The re-engagement bounty, which was to have been withdrawn at the end of 1951, is being continued for another twelve months.

RECRUITING

Despite a further increase in the number of new entries required, recruiting has generally remained satisfactory. There has, however, been some difficulty in obtaining adequate numbers on long service, as opposed to special service engagements. It has been decided to extend the entry of youths between the ages of 16½ and 17½ to the seaman and communications branches of the Navy and so increase the proportion of total entries recruited from this age-group.

NATIONAL SERVICE

Entries of National Service men to the Navy in the financial year 1952-53 are expected to number rather more than 3,000, which will increase the total bearing of National Service men in the Navy from 4,500 to nearly 6,000.

RESERVES

The retention of time-expired men in the Service continues to affect recruitment to the Royal Fleet Reserve, the strength of which has in consequence fallen recently and it is not expected that the bearing will exceed 20,000 during the financial year.

Recruitment of officers from the Merchant Navy to the Royal Naval Reserve (General Service) has been most satisfactory during 1951, except for engineers. The officer structure of the Royal Naval Reserve (Patrol Service) has recently been re-organised and the first recruiting results are very promising. The recruitment of ratings for the Patrol Service is satisfactory but the number of ratings from the Merchant Navy volunteering for the General Service section is disappointing and the overall strength of the Reserve is not expected to exceed 4,480 officers and ratings.

The Royal Naval Volunteer Reserve and the Royal Marine Forces Volunteer Reserve have continued to increase their numbers steadily. The maximum strengths are not, however, expected to exceed 11,000 and 1,500 respectively during the year.

Recruiting for the Women's Royal Naval Volunteer Reserve has now opened and provision has been made for a maximum strength of 1,500 officers and ratings in 1952-53.

Voluntary refresher training will be continued for certain members of the Royal Naval Volunteer Supplementary Reserve and the Women's Royal Naval Reserve, both of which have no training liability.

The Royal Naval Special Reserve, in which National Service men who do not join the voluntary reserve are entered for their part-time service, will be carrying out training throughout 1952-53. It is expected this Reserve will reach a bearing of about 9,500 during the year.

WORKS PROGRAMME FOR 1952-53

There will be concentration on the construction of works directly required for the support of naval operations. Among these are the extension and resurfacing of runways and the provision of additional facilities at Royal Naval Air Stations to meet the expanding needs of naval aviation, improvements in communications, work on seaward defences, and more efficient arrangements for the storage and issue of naval material at strategic places.

Provision has been made for continuing the construction of married quarters at home and overseas. The modernisation of the Royal Naval and Royal Marine Barracks and the improvement of living conditions at other Fleet Establishments will be continued as financial provision allows.

ADMIRALTY OFFICE

The number of staff at Admiralty headquarters at January 1, 1952, was 11,059, or 484 (i.e. 4·6 per cent.) more than at January 1, 1951. This

increase has been due to the continuing demands of the Government's rearmament programme, but it has been, and will continue to be, Admiralty policy to confine any increases to the lowest possible limits.

Mr. V. G. Shepheard, C.B., succeeded Sir Charles Lillicrap, K.C.B., M.B.E., as Director of Naval Construction in September, 1951.

EVENTS OF NAVAL INTEREST DURING THE YEAR

APPOINTMENT OF NEW FIRST SEA LORD

Admiral Sir Rhoderick R. McGrigor, G.C.B., D.S.O., succeeded Admiral of the Fleet Lord Fraser of North Cape, G.C.B., K.B.E., as First Sea Lord and Chief of Naval Staff in December, 1951.

VISIT TO YUGOSLAVIA

The Commander-in-Chief, Mediterranean, Admiral Sir John H. Edelsten, K.C.B., C.B.E., wearing his flag in H.M.S. Liverpool, visited Split, Yugoslavia, from September 11 to 14, 1951. This was the first visit by any foreign warship to Yugoslavia since the end of the war.

AMERICAN AND WEST INDIES STATION

After the hurricane disaster which struck Jamaica in August, 1951, H.M.S. Apollo was speedily despatched carrying a large number of tents and relief stores.

In January, 1952, a frigate was placed at the disposal of the Governor of the Falkland Islands for two months to assist in the maintenance of the bases in the Falkland Island Dependencies.

H.M. SHIPS AND THE FESTIVAL OF BRITAIN

During the period of the Festival a large number of ports and seaside resorts were visited by units of the Fleet. In all, some 80 ships of all classes took part.

ABSTRACT OF NAVY

Page	Vote	Service	ESTIMATES, 1952-53		
			Maximum Numbers		
8	A	Maximum number of officers, seamen, boys and Royal Marines, and members of the Women's Royal Naval Service and the Naval Nursing Service ..			
					153,000
			Gross Estimate	Appropriations in Aid	Net Estimate
			£	£	£
12	1	Pay, etc., of the Royal Navy and Royal Marines ..	50,242,000	400,000	49,842,000
24	2	Victualling and clothing for the Navy ..	28,592,000	9,135,000	19,457,000
32	3	Medical establishments and services ..	1,424,000	56,000	1,368,000
40	4	Civilians employed on Fleet services ..	7,236,000	55,000	7,181,000
48	5	Educational services ..	1,008,000	98,000	910,000
64	6	Scientific services ..	15,201,000	642,000	14,559,000
90	7	Royal Naval Reserves ..	1,460,100	100	1,460,000
102	8	Shipbuilding, repairs, maintenance, etc. ..	32,208,000	223,000	31,985,000
		Section I.—Personnel	82,169,000	10,219,000	71,950,000
		Section II.—Material			
		work	81,413,000	3,513,000	77,900,000
124	9	Naval armaments ..	42,848,000	6,128,000	36,720,000
144	10	Works, buildings and repairs at home and abroad ..	15,829,000	1,250,000	14,579,000
160	11	Miscellaneous effective services ..	9,797,800	2,452,900	7,344,900
172	12	Admiralty Office ..	6,876,000	10,000	6,866,000
208	13	Non-effective services ..	15,264,000	158,000	15,106,000
226	14	Merchant shipbuilding and repair ..	32,000	10,000	22,000
230	15	Additional married quarters	2,150,100	2,150,000	100
		Total	£ 393,750,000	£ 36,500,000	£ 357,250,000

(a) Owing to transfers of certain services and personnel between Votes, the totals shown enable a proper comparison to be made between the provision for 1952-53 and the previous in footnotes to the various Votes.

(b) Exclusive of Supplementary Estimates of 5,500 (H.C. 91/1951-52).

Admiralty,
February, 8, 1952 }

J. P. L. THOMAS A. MADDEN
R. R. McGRIGOR M. M. DENNY

NOTE.—The increased Appropriation in Aid from "Counterpart Funds" (*vide* State-separate "Revised Abstract" (not reproduced), issued at the same time as the Estimates. total estimate by that figure.

ESTIMATES, 1952-53

Estimates, 1951-52 (a)			Difference on Net Estimates		Vote
Maximum Numbers			Increase		
143,500 (b)			9,500		A
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease	
£	£	£	£	£	
47,647,000	473,000	47,174,000	2,668,000	—	1
21,912,000	4,148,000	17,764,000	1,693,000	—	2
1,485,000	56,000	1,429,000	—	61,000	3
6,341,000	65,000	6,276,000	905,000	—	4
884,000	84,000	800,000	110,000	—	5
12,757,000	530,000	12,227,000	2,332,000	—	6
1,730,100	100	1,730,000	—	270,000	7
28,876,000	236,000	28,640,000	3,345,000	—	Sec. I
52,653,000	5,566,000	47,087,000	24,863,000	—	Sec. II
52,964,000	1,740,000	51,224,000	26,676,000	—	Sec. III
27,307,000	3,130,000	24,177,000	12,543,000	—	9
13,837,000	770,000	13,067,000	1,512,000	—	10
8,049,300	2,195,400	5,853,900	1,491,000	—	11
5,900,400	6,000	5,894,400	971,600	—	12
15,196,000	161,000	15,035,000	71,000	—	13
161,100	39,500	121,600	—	99,600	14
1,500,100	1,500,000	100	—	—	15
299,200,000	20,700,000	(c) 278,500,000	79,180,600	430,600	

Net increase £78,750,000

under Votes 1, 2, 3, 4, 6, 8 (Sections II and III), 9, 12, and 14 have been adjusted to year, and so differ from those printed in the Navy Estimates 1951-52. Details are given

(c) Exclusive of Supplementary Estimates of £10 (H.C. 91/1951-52).

MOUNTBATTEN
OF BURMA
E. W. ANSTICE

G. GRANTHAM
E. M. EVANS-LOMBE

ALLAN NOBLE
S. WINGFIELD DIGBY
J. G. LANG

ment on Defence, paragraphs 4 and 6) are not included above. They were shown in a The £25 million allotted to the Navy was all allocated to Vote 8, III, and reduced the

**MEMORANDUM OF THE
SECRETARY OF STATE FOR WAR RELATING TO
THE ARMY ESTIMATES, 1952-53
(Cmd. 8477)**

The Army Estimates for 1952-53 amount to :

	£	585,970,100
Gross Expenditure	64,470,000	
Appropriations in Aid	<u>£521,500,100</u>	

2. For the three previous years the figures were :

	1951-52	1950-51	1949-50
	£	£	£
Gross Expenditure ..	466,520,100	341,600,100	356,200,000
Appropriations in Aid ..	47,720,000	42,600,000	51,500,000
	<u>£418,800,100(a)</u>	<u>£299,000,100(a)</u>	<u>£304,700,000</u>

3. Gross expenditure in the Army Estimates for 1952-53 shows an increase of £119,450,000 over the Estimates for 1951-52. An increase of 24,000 on Vote A for the numbers of personnel in the Army, the growth of the Territorial Army and the Supplementary Reserve, and the increase in the general level of wages and prices is partly responsible. In addition, the estimated gross expenditure on stores (Vote 7) is £234,000, as compared with £147,340 in the previous year. Increased provision is also made for works services (Vote 8), whilst provision for married quarters to be paid for under the Armed Forces (Housing Loans) Act, 1949 (Vote 11), is the same as for 1951-52. Non-effective costs show a temporary decrease, due mainly to a satisfactory trend towards increased numbers for longer periods of service.

4. The Appropriations in Aid in the Estimates for 1952-53 are larger than those provided for in Estimates for 1951-52. The increases arise mainly on increased receipts from the sale of food to families, the other Services, etc. (Vote 6), and from the sale of stores (Vote 7) and from colonial contributions (Vote 1).

5. Since the estimates were prepared the Government of the United States of America has agreed, as was announced by the Chancellor of the Exchequer on January 29, 1952, to grant economic aid towards some of the burden of defence undertaken by the United Kingdom in the common cause. To carry out this agreement I am presenting a revised estimate of the appropriations in aid and of the net total of Vote 7 for the Army's share of these receipts.

6. The present estimates cover the second year of the programme of

(a) Excluding Supplementary Estimates.

increased and accelerated defence preparations; but, owing to the critical position of our national finances and for the other reasons explained in the Statement on Defence (Cmd. 8475), the anticipated increases for production generally, for capital works and for labour have not been realised.

OPERATIONAL

GENERAL

7. In Korea and Malaya, and, since last autumn, in Egypt, our troops have been serving under conditions of active service. The operational requirements of the Far East and the Middle East, and the need to give maximum support on the Continent to our fellow members of the North Atlantic Treaty Organisation, have compelled me to reduce our Active Army at home to negligible proportions. These circumstances have led to the formation of the Home Guard (*see* paragraphs 29 and 30) and to the further measures which I describe in paragraph 50 below; and also to the formation, already announced, of seven new infantry battalions.

EGYPT EMERGENCY

8. The situation in the Suez Canal Zone, resulting from the unilateral claim by the Egyptian Government to have abrogated the 1936 Treaty on October 18, 1951, made necessary the reinforcement of the garrison by the 16th Independent Parachute Brigade Group. As a precaution, this formation had been despatched to the Middle East earlier in consequence of the Anglo-Persian oil dispute. Our Middle East Land Forces were further reinforced last autumn by the 3rd Infantry Division. Throughout the difficult situation in Egypt our troops have shown forbearance and firmness in the face of much provocation.

KOREA

9. British units in Korea, joined by other units from the British Commonwealth and Empire, are now fighting as the Commonwealth Division. Before and since that division was formed the United Kingdom troops have played a full, and sometimes an outstanding, part in all operations in which they have been engaged. They have upheld the British Army's high standard of discipline and steadfastness, and their efficiency and resolution as fighting men have earned them universal acclaim.

MALAYA

10. Despite all our efforts the organised armed threat to law and order in Malaya continues and necessitates the deployment of substantial military forces. Both regulars and national servicemen have brought to all their tasks initiative and a high morale. Our forces have recently been reinforced by two battalions from East Africa and a Fiji battalion. These colonial troops have received a warm welcome from the British Army and the loyal peoples of Malaya.

HONG KONG

11. We continue to maintain the reinforced garrison of Hong Kong in order to meet any threat which may develop.

EUROPE

12. Our obligations under the North Atlantic Treaty involve heavy commitments for the British Army of the Rhine and, to a lesser extent, for British Troops in Austria and the British Element of the Trieste International Force. Within recent months we have added to the number of fighting formations in Germany. Our contribution of three Armoured Divisions represents a major element in the striking force available in Europe.

OTHER STATIONS ABROAD

13. The Army has also to provide garrisons for Mediterranean stations and the West Indies, and to provide officers and non-commissioned officers for staff and training for the colonial forces, and for international organisations, such as the North Atlantic Treaty Organisation, etc., in many parts of Europe and in America.

MANPOWER

14. The supply and allocation of manpower for the Army continues to present one of our most difficult problems. Different considerations arise on each of the four main divisions of this subject, viz.:

ACTIVE ARMY

- (a) Regular personnel.
- (b) National servicemen.

RESERVE ARMY

- (c) Volunteers.

ACTIVE AND RESERVE ARMIES

- (d) Officers.

ACTIVE ARMY

15. World events place a heavy strain on the regular element in the Active Army, and this strain tends to increase. To meet our commitments in Korea and elsewhere, it was necessary to call up a number of army reservists and to retain, beyond their normal term of service, regular officers and other ranks. Clearly there must be a limit to the time for which individuals are held in peace-time under these measures, and I have, therefore, released all the regular reservists who were called up in 1950 for service in Korea and have made a start in releasing time-expired regular officers and soldiers, a course which it is intended to complete by the autumn of 1953.

16. *Regular Soldiers*.—Though the new rates of pay announced in September, 1950, brought some immediate increase in the number of regular recruits it was considered that the terms of service offered to the regular soldier could be made more attractive by additional changes. A new regular engagement of three years with the Colours and four years with the Reserve was, therefore, introduced in November, 1951, and this has already produced favourable results. In many cases a career up to the age of 55 years is now open to men who remain fit and efficient.

17. During 1951, 18,530 men from civil life enlisted on normal

engagements, of whom 2,983 enlisted in the last two months of the year, which are normally the worst for recruiting. National servicemen and short-service men are now taking regular engagements at about three times the rate they did in 1950 and it is hoped that this improvement will continue. The total enlistments for the year from all sources on normal engagements were 25,330, compared with 22,125 for the year 1950; and on short service engagements there were a further 1,042, compared with 3,182 in the previous year. In addition, since the introduction of the new pay rates, the number of regular soldiers extending their service to complete 12 years with the Colours has been multiplied by five, and the number re-engaging to complete 22 years has risen by 40 per cent.

18. Despite recent improvements we have no cause for complacency about regular recruiting and I have been considering what further measures might be taken to improve the attractions of a regular engagement. I shall propose an amendment to the Army Act which would allow men to enlist for a career engagement of 22 years from the start of their service. Men enlisting on this new engagement would be given the right to leave the Army if they want to at three-yearly intervals. I shall also propose that men serving on current engagements should have the option of transferring to this new long-service engagement.

19. *National Servicemen*.—During the year ending March 31, 1952, the number of national servicemen available to the Services was increased by restricting deferments of agricultural workers, and slight modifications in current medical standards. In spite of these measures, the Army share of this year's national service age group would be insufficient. Unless measures were taken to increase the size of the national service pool, it might not be possible to maintain the Army at its present strength. It has, therefore, been decided to have five national service registrations instead of the usual four in the coming year and this will increase the allotment to the Army by nearly 30,000 men.

REGULAR WOMEN

20. *General*.—We want to do everything possible to increase the number of women serving with the regular women's organisations within the Army.

21. *Queen Alexandra's Royal Army Nursing Corps*.—The high standard of nursing in the Army has been maintained, though the Queen Alexandra's Royal Army Nursing Corps is still much below its establishment. The intake of nursing officers during 1951 was 212, against a wastage of 150. Part-time civilian nurses are being employed in military hospitals to ease the strain on nursing officers due to the present deficiency.

22. On December 31, 1951, the strength of the other ranks in Queen Alexandra's Royal Army Nursing Corps was 576, of whom 109 were serving overseas. The intake during 1951 was 389 and the wastage 128. The ultimate requirement of other ranks is 1,426. Their training is proceeding satisfactorily, and the standard of entrants continues high.

23. *Women's Royal Army Corps*.—The direct entry scheme, under which a woman can enter the Women's Royal Army Corps as a prospective officer from civil life is proving a success, and during the year 1951, in addition to those commissioned from the ranks, 28 candidates were commissioned from entries under the scheme. In July, 1951, a Women's

Royal Army Corps Staff College was opened to train officers for Grade II and III Staff appointments. Recruiting of other ranks has been lower—1,941 in 1951 against 2,724 in 1950. I hope that measures now being considered may lead to a marked improvement in recruiting.

RESERVE ARMY

24. The Reserve Army is made up of the Supplementary Reserve and the Territorial Army. Both will draw their main strength by 1954 from national servicemen who, having completed their full-time service with the Active Army, will be completing their national service by three and a half years service in the Supplementary Reserve or the Territorial Army. Already 105,000 national servicemen (including 3,000 officers) have completed their full-time service with the Active Army and have passed into the Reserve Army: this number will eventually increase to over 300,000 by the autumn of 1954.

25. Both these branches of the Reserve Army need, if the national service system is to work efficiently during the period of part-time service, an adequate number of volunteers, particularly to fill the ranks of officers, warrant officers and non-commissioned officers. It has always been hoped that many national servicemen would undertake a volunteer engagement in the course of their national service; and this hope is being realised in the Territorial Army, in that 25 per cent. of the national servicemen joining it in 1951 have undertaken volunteer engagements. I hope that, after this year's camp training, more national servicemen in the Supplementary Reserve will become volunteers: they cannot do so before completing an annual camp, and this fact may explain why a comparatively small number have so far undertaken voluntary engagements. The importance of increasing the volunteer element in both the Supplementary Reserve and the Territorial Army by the summer of 1954, when they will have a full complement of national servicemen, cannot be over-emphasised.

26. *Supplementary Reserve*.—The role of the Supplementary Reserve is to provide some of those units and individuals required within the first six months, and more particularly within the first two months, after mobilisation. Largely they comprise units which cannot conveniently be maintained in the Territorial Army. The Territorial Army itself is mainly organised in divisions, and for this reason the Supplementary Reserve is required to provide non-divisional troops and specialised units which need to recruit on a country-wide rather than a territorial basis. It is largely drawn from men working in civil life on duties very similar to those for which they would be required in war. Most of these men attend 15 days camp annually, but have no other training obligation in peace. The Supplementary Reserve units already formed, or now being formed, will provide army troops, communication zone and base units for home and overseas, required within the first two months of mobilisation.

27. The volunteer strength of the Supplementary Reserve is only about one-fifth of what we need. The Supplementary Reserve now includes about 36,000 part-time national servicemen and will eventually reach 100,000. There is a particular shortage of warrant officers and sergeants, without whom the task of building up these specialist units is extremely difficult. Although we have formed nearly three-quarters of the units we

shall require, many of them have had to be temporarily strengthened, during training, with regular instructors because the volunteer element is deficient.

28. *Territorial Army*.—The growth of the Territorial Army, which is the principal element of the Reserve Army, has continued and there are now over 70,000 national servicemen serving with it. The volunteer element has decreased slightly because a large number of men who have completed their voluntary engagements have not re-inlisted. The strength of 77,206 on December 1, 1950, had fallen to 73,403 a year later, and is still slowly falling and, on January 1, 1952, was 70,796. Here again we are particularly short of warrant officers and sergeants, and the increasing flow of national servicemen throws a heavy strain on those volunteer warrant officers and senior non-commissioned officers now serving.

HOME GUARD

29. In accordance with the Home Guard Act, 1951, the registration of volunteers has opened and enrolment will begin in the near future. Effective battalions will be raised in the Eastern and Northern Commands and they will start to carry out unit and sub-unit training in 1952. In addition, I aim at having just over 400 cadre battalions spread over the whole of the United Kingdom. These cadres, which should each be about 50 strong, will consist mainly of officers and non-commissioned officers. The main role of the cadre battalions will be to plan for the tasks which would be allotted to them in war and to register potential volunteers who would be ready to join immediately an emergency arose.

30. Enrolled members of the Home Guard will each be issued with a rifle or sten gun as his personal weapon, and other weapons will be made available to units according to their operational roles. I hope also to be able to issue to those in effective battalions, battledress, including shirts and ties, boots and web equipment.

OFFICERS

31. The fighting value of any army will always depend, not only on the quality of its men, weapons, equipment and training, but on an adequate number of officers of the right quality. Both the Active and Reserve Armies are having difficulty in finding sufficient officers. We have already taken a number of steps designed to encourage suitable candidates to come forward and take commissions in the Regular Army, and further steps are being considered.

32. We have already announced measures which:

- (a) will enable regular officers to continue serving to a much later age, and
- (b) will provide employment for suitable retired officers, and thereby release officers on the Active List in the middle ranks from staff and other static appointments.
- (c) increase the pay of officers in the technical arms.

These measures will, I hope, help to attract suitable young men to consider a regular commission as a life career.

33. We recognise, however, that there may be a considerable number who, while not attracted to the Army as a career, would be glad to have an opportunity to widen their experience through a short period of service in the Army. To meet such cases, we offer suitable national servicemen training and commissioning as officers during their national service; followed by a short-service commission, for any number of years up to eight. Short-service commissions are also offered to suitable serving regular other ranks and to those who have served as officers (other than as regular officers) in the Active Army. There are a number of officers who took short-service commissions after service during the last war, and who are now nearing the end of the period covered by their present commission. I am examining the possibility of offering to some of them a further period of service as commissioned officers with the Active Army.

34. Although the measures to which I have referred will, I hope, do something to increase the intake of regular officers in general, it seems unlikely that they will meet our needs in full, particularly in the technical arms. I am, therefore, reviewing conditions of entry alternative to Sandhurst with the special object of encouraging more candidates with technical qualifications and interests.

35. Turning to the Reserve Army, we want more officers for the middle ranks of both the Supplementary Reserve and the Territorial Army. Junior national service officers passing into the Reserve Army after completing their full-time service with the Active Army will, it is hoped, eventually qualify for promotion and help to meet this need. In the meantime we are trying to attract experienced ex-officers into these posts, and I am also considering how best to induce officers with experience on the staff, who are now in civil life, to volunteer for appointments in Territorial Army formation headquarters and other staff posts in the Reserve Army. In addition, direct approaches are being made to individuals, with the necessary technical qualifications, who might fill some of the vacant specialist posts in the officer establishments of the Supplementary Reserve.

ARMAMENTS AND STORES

36. The Estimates include provision for the second instalment of the rearment programme to re-equip the Army with new and up to date weapons. A start is also being made in the provision of war reserves to maintain the Field Force overseas, if war should come. Some two-thirds of the estimated expenditure on armaments and stores is for tanks, anti-aircraft and other weapons, including their maintenance. The remaining third of the expenditure is for clothing, equipment and stores, including the day to day maintenance of the Army, for furnishing married quarters in the building programme and for a further modest instalment towards approved scales in living accommodation.

TANKS

37. The last year has seen our most modern tank, the Centurion, prove its value in Korea, where, although it has not been called upon to deal with enemy tanks, it has given valuable support to our infantry. It is generally recognised that this tank is one of the best, if not the best, of its size in any modern army. Its production is satisfactory and increasing. We are also

trying to increase the fighting efficiency of our tanks by the development of more advanced components, such as sights and wireless.

NEW WEAPONS

38. A rearmament programme inevitably takes time to produce results, but during the financial year 1952-53, new weapons and equipment will begin to come into the hands of troops in substantial quantities. In addition, due to the urgent need for early readiness, considerable effort has been devoted to modernising war-time weapons and equipment, thereby greatly improving their efficiency and performance. This is particularly true of anti-aircraft weapons, an expensive but essential expedient until quantity production of guided missiles, etc., is achieved.

SOFT VEHICLES

39. As a result of work carried out in the last few years, designs for a number of new types of vehicles incorporating the results of a close study of the lessons of the last war were agreed upon and ordered. The first production in quantity of nearly all types of these special military vehicles will take place in 1952-53. Our requirements range from 5-cwt. trucks to heavy tractors for tank transporting, and I have provided in Estimates 1952-53 a substantial sum for these essential "soft" vehicles.

VEHICLE REBUILDING

40. The third and final year of the Ministry of Supply programme for rebuilding wheeled vehicles for the Army has been completed; it has been supplemented by the rebuilding of numbers of vehicles in army workshops in the United Kingdom and in Germany. Nearly 50,000 vehicles have been rebuilt; but the quantity of vehicles now available for such treatment is going down.

41. The repair and renewal of vehicles and weapons must, however, continue, and during 1952-53 the maximum capacity, both in the Army's workshops and that available to the Ministry of Supply, will be fully occupied on these vital tasks.

STANDARDISATION

42. Discussions with a view to standardising equipment and spare parts, wherever practicable, are continually taking place with the other Services, with the North Atlantic Treaty Powers and with the self-governing members of the British Commonwealth. Although progress has been made, much yet remains to be done. The problems presented are often difficult and complicated, but we are determined to do all we can to achieve standardisation over the widest possible field.

WORKS

43. To satisfy the needs of the Army for anti-aircraft defence sites and other defence works, as well as for accommodation for troops and their families, and for equipment, stores and supplies, new construction is required far in excess of the works potential available to it. The needs of the civil population and of defence production, as well as those of the other

Services, have also to be met from the total resources of materials and labour available. These facts, as well as the difficult financial position in which the country finds itself, impose severe limitations on what can be attempted in any one year. Consequently, the amount of new accommodation we can provide for our troops will be much less than what is needed, and we shall, of necessity, continue to occupy war-time huttied accommodation at home, and, in the Middle and Far East, tents and huts. Our main effort will be devoted to the extension of our anti-aircraft defences and to the provision of storage for vehicles, weapons and other equipment which will be produced under the rearmament programme.

HOME

44. In order to avoid sudden or unrelated decisions for the provision of accommodation, a long-term plan for the distribution of accommodation etc., for the Army at home has been drawn up and approved. Although defence works must remain our principal preoccupation, some new barrack blocks will be completed. The provision of married quarters, financed by the Armed Forces (Housing Loans) Act, 1949, is proceeding.

45. *Covered Accommodation for Stores.*—The great expansion in the Army's stocks of vehicles, ordnance and engineer equipment and stores, demands additional covered storage accommodation. In the year 1952-53 we plan to build about one-third of the total new accommodation which is likely to be required eventually. This will meet, approximately, the intake of stores during the same period, but there is bound to be difficulty in storing all our new vehicles under cover.

ABROAD

46. In the Far East a number of administrative establishments, on which work is now in hand, will be completed and further progress will be made with married quarters. Although the uncertain situation in Egypt will curtail works services there, we will do our best to improve the living conditions of the augmented garrison, so far as local conditions permit. During the year I hope to start the much needed major building scheme for the garrison of Cyprus. As a result of the establishment of the Kingdom of Libya we have to vacate accommodation in Tripoli, required for State purposes, and we shall, therefore, have to build elsewhere. Exceptional demands have arisen from two disasters during the past year, the explosion at Gibraltar and the hurricane at Jamaica: rehabilitation measures are in hand.

TRAINING

47. Despite the heavy increase in the demands made on the Army by our commitments abroad in 1951, I can record real progress in training both the Active and Reserve Armies. Widespread regard among experts and other forces in Korea, for the tactical and operational skill of our troops, confirms the soundness of our present system of training; but new methods are constantly being introduced, both in the basic training of our troops and in the special instruction given in our Army schools, based on practical experience gained in Korea, and manœuvres held in the United Kingdom and in Germany.

ACTIVE ARMY

48. The new regular divisions which were raised in 1950-51 were exercised, with previously existing forces, at manœuvres held in the United Kingdom in the autumn of 1951, in which particular attention was paid to co-operation between ground and air forces. The part taken in them by the Royal Air Force was the largest since the war. Joint manœuvres were also carried out by the British Army of the Rhine in Germany in association with contingents from other allied forces stationed in Germany.

49. Steps taken to exchange officers, men and units with armies of other North Atlantic Treaty countries have worked well and their scope was greatly increased in 1951. These measures help to foster mutual understanding of tactical methods and doctrine. It is proposed to continue these exchanges in 1952.

50. All regular static units and establishments at home are being trained in an operational role. The men in these units have been armed, and their roles are to resist any attack on this country. As many as possible will be organised for use in mobile columns.

RESERVE ARMY

51. During the past year certain Territorial Army formations were brought up to effective strength for annual camp by the call-up of Z reservists: similar action was taken for training some regular and Supplementary Reserve units, and certain new units of the Supplementary Reserve. The call-up of Z reservists was a new step, but despite the lack of previous experience arrangements were generally satisfactory. A similar call-up will take place in 1952. As far as possible men are being called up on a geographical basis, but, for various reasons, this is not possible in many cases. The shortage of regular troops in the United Kingdom, to which I referred in paragraph 7 above, increases the strain which the training of reservists inevitably throws on the comparatively few regular troops available, and on the volunteer officers, warrant officers and non-commissioned officers of the Reserve Army.

52. All existing Supplementary Reserve units will train again in 1952, and, in addition, we shall form more new units from Z reservists.

TRAINING AREAS

53. The provision of training areas for the post-war Army has proceeded on the lines laid down in the white paper on Needs of the Armed Forces for Land for Training and Other Purposes (Cmd. 7278). Nearly all the major areas have been approved, after consultation with the planning and other authorities, and acquisition of the land or of training rights has made good progress. Unless there are unforeseen developments, it is not likely that further major requirements will arise, though there may have to be some adjustments or changes in addition to or within existing areas. The greatest care has been, and will continue to be, taken in avoiding interference with agriculture, forestry, etc., and where it is possible we shall try to combine other uses with military training.

MOVEMENTS

54. Not only have transport charges risen considerably during the past year, but so has the proportion of our forces overseas, thereby increasing

our movements commitment, both for men and material. Unfortunately, a very considerable proportion of these men are national servicemen, whose overseas tour of duty is well under two years. For these reasons the post-war volume of movement has constantly increased; and in 1952-53 it will exceed even that of 1951-52.

55. The relief of overseas forces by sea means that, at any one time, a large number of men are non-effective while passing through the "pipeline." I am, therefore, doing everything possible to extend the use of air transport for those journeys which can be more conveniently and economically made by air. This service is being provided partly by Royal Air Force aircraft of Transport Command, but mainly by civil aircraft under contract.

56. Up to last year the Minister of Transport had made considerable progress in refitting existing troopships in accordance with post-war standards. Unfortunately, the unforeseen events of the past year have laid such a burden on our transport resources, that ships, due to be laid up for full or partial conversion to post-war standards, have had to continue in service in their present state. We shall try to put this right as soon as possible, but it will not be easy.

GENERAL

DISCIPLINE

57. The standard of discipline continues to improve, and the incidence of serious crime, including stealing, has been reduced. The most frequent offence continues to be absence without leave. Discipline among Z reservists, called up for training was high, and out of over 145,000 called up, less than 100 had to be prosecuted for failure to attend training.

HEALTH

58. The health of the Army during 1951 has been good. The rates of admission to hospitals in the United Kingdom and in all theatres overseas, except Korea and Japan, have remained substantially the same as in previous years, while in the Far East Land Forces there has been some improvement despite operational conditions.

59. In Korea and Japan the higher total admission rates are due partly to the inclusion of cases of wounds and accidents. For the rest, the incidence of diseases is comparable to that amongst the Far East Land Forces, and is not unsatisfactory, when allowance is made for the difficulties of the campaign and the severe climate.

60. The incidence of malaria has not been serious. In the Middle East it has fallen markedly, though amongst the Far East Land Forces it has risen slightly. In Korea it has been low and there is no doubt that a low incidence of malaria almost invariably indicates a well-disciplined unit or formation. It is satisfactory to report that the high incidence of enteric fever in the Middle East has fallen, and in 1951 was the lowest since the war.

61. Close attention has been directed to the medical problems likely to arise from atomic, biological and chemical warfare, and to the introduction of new drugs and medical methods into the Army. A special research into the causes and prevalence of skin disease in the Middle East was begun,

but operational conditions are preventing the satisfactory completion of this investigation.

62. A medical team again visited Canada in the spring of 1951 to study medical problems in sub-arctic regions.

EDUCATION

63. *Soldiers*.—Aided by the Central Committee for Education in Her Majesty's forces we have continued to link all aspects of education in the Army to that in the civilian world, and we are making every effort to provide, at home and overseas, educational facilities for our troops comparable with those available in civil life.

64. Unless exempted because he has a superior educational qualification, e.g. School Certificate, every national serviceman is required to undergo a course of general education for a period of up to 12 months. In addition, further education, adapted to the individual needs of national servicemen who have a School Certificate or equivalent qualification, is provided under unit arrangements, through Army Education Centres, Higher Education Centres, Local Education Authorities or correspondence courses, and the response to the opportunities so provided has been most gratifying.

65. In April, 1949, it was announced that educational qualifications, corresponding to those applicable before the war, would be reintroduced as conditional before promotion, and under these arrangements promotion to warrant officer is restricted to those who have at least a First Class Army Certificate of Education. The reintroduction of this educational condition for promotion naturally produced an unusually high number of candidates for Army Certificates of Education in the following year and, as a result, 4,057 obtained First Class Certificates in 1950, whereas the number dropped to just under 3,000 in 1951.

66. *Resettlement in Civil Life*.—We provide for regular soldiers during the latter part of their service resettlement courses and training facilities covering the principal trades, commerce and general studies, and, in particular cases, soldiers may have a full-time course of 28 days at a Higher Education Centre. These courses are reviewed from time to time, in consultation with the Minister of Labour, so that they may be co-ordinated with the vocational training courses for which he is responsible. Thus we attempt to give the regular soldier assistance in preparing himself to take a useful and effective part in civil life. To assist regular soldiers coming to the end of their Army service, we also maintain a resettlement information and advice service through which they may obtain up to date information and expert advice. In this respect I would like to acknowledge the Army's indebtedness to the constant and constructive efforts made by my colleague the Minister of Labour. The Trade Unions have also been most co-operative.

67. *Children*.—There has been a steady increase in the number of children in Army schools overseas, except in Egypt where evacuation of families has caused some reduction. We have progressed further towards providing in the Army children's schools a standard of education similar to that in civilian schools in the United Kingdom: in particular we have recruited more teachers seconded by Local Education Authorities, and

improved the supply of books and equipment. Nevertheless, much remains to be done in assisting the Army in the education of children. I regard this as a most important matter and one which often places married soldiers in considerable difficulty.

68. *News*.—All soldiers overseas receive an efficient daily news service, including, in Korea and the Canal Zone of Egypt, news broadsheets.

N.A.A.F.I.

69. The Navy, Army and Air Force Institutes continue to provide canteen and many of the club facilities for the British Army. No matter where the Army may be called upon to serve, N.A.A.F.I. follows at the earliest opportunity and establishes the best services which circumstances will allow.

WELFARE

70. With the whole-hearted and loyal co-operation of voluntary philanthropic organisations, whose help I gratefully acknowledge, we continue seeking to improve amenities for our soldiers in all parts of the world. Special efforts are now being made in Egypt, Malaya and Korea.

ANTONY HEAD.

THE WAR OFFICE,
February 19, 1952.

ABSTRACT OF ARMY

Vote	Service	ESTIMATES, 1952-53		
		Gross Estimate	Appropriations in aid	Net Estimate
A	Maximum number of officers and other ranks to be maintained for Army Service			555,000
1	Pay, etc., of the Army	126,200,000	16,400,000	109,800,000
2	Reserve Forces, Territorial Army, Home Guard and Cadet Forces	18,360,000	160,000	18,200,000
3	War Office	3,230,000	50,000	3,180,000
4	Civilians	50,300,000	1,800,000	48,500,000
5	Movements	29,550,000	250,000	29,300,000
6	Supplies, etc.	61,180,000	13,280,000	47,900,000
7	Stores	234,000,000	18,000,000	216,000,000
8	Works, buildings, and lands ..	35,750,000	5,250,000	30,500,000
9	Miscellaneous effective services ..	4,970,000	3,570,000	1,400,000
10	Non-effective services	16,930,000	210,000	16,720,000
11	Additional married quarters ..	5,500,100	5,500,000	100
	Total	585,970,100	64,470,000	521,500,100

(a) Excludes Supplementary Estimates of £10,000,000.

War Office,
February 11, 1952.

NOTE:—The increased Appropriation in Aid from Counterpart Funds (*vide* Statement on Defence, paragraphs 4 and 6) are not included above. They were shown in a separate "Revised Abstract" (not reproduced), issued at the same time as the Estimates. The £30,000,000 allocated to the Army was all allocated to Vote 7, and reduced the total Estimate by that figure.

ESTIMATES, 1952-53

Estimates, 1951-52			Difference on Net Estimates		
		527,000	Increase 28,000		A
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease	Vote
£121,830,000	£11,660,000	£110,170,000	£—	£370,000	1
13,750,000	110,000	13,640,000	4,560,000	—	2
2,668,000	48,000	2,620,000	560,000	—	3
46,644,000	1,034,000	45,610,000	2,890,000	—	4
23,120,000	350,000	22,770,000	6,530,000	—	5
51,940,000	9,900,000	42,040,000	5,860,00	—	6
147,340,000	13,000,000	134,340,000	81,660,000	—	7
32,030,000	3,890,000	28,140,000	2,360,000	—	8
3,600,000	2,130,000	1,470,000	—	70,000	9
18,098,000	98,000	18,000,000	—	1,280,000	10
5,500,100	5,500,000	100	—	—	11
£466,520,100	£47,720,000	£418,800,100 (a)	£104,420,000	£1,720,000	

Net increase £102,700,000

ANTONY HEAD
J. R. H. HUTCHISON

W. J. SLIM, C.I.G.S.
G. IVOR THOMAS, O.M.G.
N. C. D. BROWNJOHN, V.C.I.G.S.
J. F. M. WHITELEY, D.C.I.G.S.

G. W. TURNER

**MEMORANDUM BY THE
SECRETARY OF STATE FOR AIR TO ACCOMPANY
AIR ESTIMATES, 1952-53**
(Cmd. 8474)

1. The net total of Air Estimates for 1952-53 is £467,640,000. Provision is also made for a maximum sum of £5,400,000 to be issued out of the Consolidated Fund, under the Armed Forces (Housing Loans) Act, 1949, for the construction of additional married quarters.

2. The net total for 1952-53 is £138,890,000 more than the corresponding figure in Air Estimates for 1951-52 (excluding a Supplementary Estimate of £1,800,000 that is being presented). Broadly, the increase results from measures taken, or to be taken, to expand and re-equip the Royal Air Force, from increases in prices and from improvements in emoluments.

3. Since the Estimates were prepared, agreement has been reached with the Government of the United States of America on matters relating to the appropriation in aid of defence expenditure in 1952-53 of issues to be made from the sterling counterpart funds arising from the grant of economic aid to the United Kingdom. This aid was announced in general terms by the Chancellor of the Exchequer in the House of Commons on January 29, 1952, and an explanation of its application to defence expenditure will be found in the Statement on Defence, 1952. It is estimated that the sum to be allocated out of the counterpart funds in aid of air force expenditure will be £30,000,000 and a Revised Estimate providing for this additional appropriation in aid will shortly be presented. The effect of the revision is that the gross total of Air Estimates will remain at £520,843,100, but the net total will become £437,640,000.

GENERAL

4. The Royal Air Force has grown stronger during the last year, but this progress, important in itself, is only the first contribution towards the plan for expansion of the front line strength of the Royal Air Force in accordance with the defence programme announced at the beginning of 1951. While new squadrons have been forming and existing squadrons re-equipping, preparations have been going ahead for further expansion. The programme for the Royal Air Force in the coming financial year similarly provides both for an increase in the front line, considerably larger than in 1951-52, and for preparations for the further expansion. Under this programme, the Royal Air Force is making very heavy demands on the resources of the country. Her Majesty's Government, in association with the Commonwealth and the other countries of the North Atlantic Treaty Organisation, are determined to raise the strength of their defence forces in order to provide an effective deterrent to aggression; and in this nothing is more important than to increase our strength in the air. The

rate of progress must be related to economic and financial conditions, but, whatever the difficulties, the need is such that the most urgent requirements of the Royal Air Force will have first call on the national resources.

5. In Fighter Command, there have been further increases in the strength of the forces for defence of the United Kingdom, against attacks by day or night. Nearly all the regular day interceptor squadrons now have the latest marks of Meteor aircraft. The Royal Auxiliary Air Force squadrons all have jet aircraft. The re-equipment of night fighter squadrons with jet aircraft is almost complete.

6. In Bomber Command, the first Canberra squadrons have been formed and more will follow during 1952. The medium bomber force will still be made up of Washingtons and Lincolns until later types, such as the Valiant, come into service, but its strength has been increased by the formation of further squadrons of Washingtons.

7. Coastal Command has been strengthened, but further expansion is necessary for the Command to perform its increasingly important role. New squadrons for maritime operations are therefore being formed with Shackleton aircraft, and with Neptune aircraft which are being supplied from the United States of America under the Mutual Security Act.

8. In Europe, the Royal Air Force 2nd Tactical Air Force is a most important contribution to the resources of the Supreme Allied Commander. Our largest expansion is taking place in this Command; its increased front line strength will include squadrons equipped with Venom aircraft. I look forward to the closest possible association of this force with the proposed European Air Force. It is my belief that there is much that we can do which would be both practicable and advantageous.

9. The fighter squadrons of the Royal Auxiliary Air Force were called up for three months' intensive training last year with regular squadrons of Fighter Command under the Reserve and Auxiliary Forces (Training) Act, 1951. The squadrons showed outstanding keenness and their operational readiness has been greatly increased.

10. As an additional measure to improve the state of readiness of the air defences, over 7,000 reservists were called up in 1951 for 15 days' refresher training in the Control and Reporting System. Similar training for the Control and Reporting System will take place this summer. Several hundred reservists were called up last year for three months' intensive flying training; and nearly 100 qualified instructors returned for a period of eighteen months to help train the pilots needed by the expanding Force.

11. The overseas Commands of the Royal Air Force, together with Transport Command, have been actively engaged in the support of British policy. In the Far East, Sunderland aircraft under the United Nations Command have continued to carry out patrols and reconnaissance over Korean waters. In Malaya, the Royal Air Force, in close co-operation with the land forces and police and with squadrons of the Royal Australian Air Force and the Royal New Zealand Air Force, has continued its operations against the bandits, being employed in tasks of reconnaissance, ground attack, bombing and supply-dropping. The helicopter casualty evacuation flight in Malaya has been invaluable in carrying back wounded. Hastings aircraft of Transport Command have run a casualty evacuation

service conveying wounded soldiers of the United Nations forces from Korea. During the summer, aircraft of the Middle East Air Force and Transport Command were kept constantly ready in case it was necessary to ensure the protection and evacuation of British subjects living in Persia. In October, Transport Command accomplished, at short notice and without any mishap, the task of carrying large formations of British troops to the Middle East, while Valetta aircraft of the Middle East Transport Wing were carrying out emergency troop movements within the Middle East. During the last few months, Royal Air Force ground personnel, including squadrons of the Royal Air Force Regiment, have assisted the Army in the control of the difficult situation in the Canal Zone.

12. Close co-operation with other Commonwealth and Allied Air Forces has continued. The strength of the United States Air Force in this country has been increased by the addition of fighter squadrons. Fighter squadrons of the Royal Canadian Air Force are also stationed here and are training with Fighter Command.

13. During the last year, Royal Air Force squadrons had more operational training than ever before in peace. The Royal Air Force took part to an increasing extent in exercises with the armed forces of other North Atlantic Treaty nations.

PERSONNEL

14. Between April and October, 1951, the total strength of the Royal Air Force rose from 238,000 to 262,000. This increase was mainly due to the compulsory retention of regular airmen for up to 12 months beyond the end of their engagements. Since October, the strength has risen more slowly: it is expected to reach 270,000 by April, 1952.

15. Whilst there is no overall manpower shortage in the Royal Air Force, there is a shortage of highly skilled men in certain trade groups. This lack of experience can be made good only by the progress of time, but the new engagements up to the age of 55, introduced at the beginning of 1951, are helping to keep skilled and experienced men in the Royal Air Force.

16. The number of national service volunteers for aircrew service has been up to expectations, and although these men can give very little full-time trained service, they will make a very important contribution to the Reserve.

17. Entries to regular aircrew service, particularly pilots and navigators, improved steadily throughout the year. The main reason for this improvement was the introduction in June 1951 of a new four-year engagement, but improved conditions of service have also contributed to this result.

18. An important change in the method of meeting requirements for junior officers has been made by the introduction of a new class of officer somewhat similar to the Branch Officers of the Royal Navy. Warrant Officers and Chief Technicians are being given an opportunity to obtain permanent commissions as Branch Officers, serving until age 55 with limited prospects of promotion, but on a wide range of ground duties suited to the experience which they have gained in the ranks. They will receive special rates of pay appropriate to their age and experience, and enhanced pensions. In this way, better advantage will be taken of the

skill and experience of the best Warrant Officers and Chief Technicians in carrying out duties requiring executive authority.

19. To supplement the supply of directly entered University graduates to the Technical Branch, a new Technical Cadet Scheme will be opened this year. Under this scheme, young men with appropriate educational qualifications will be granted permanent commissions for technical employment after a course of training which includes a three-year honours degree course at a university.

20. During 1951, 1,062 apprentices joined the Service, 66 per cent. more than in 1950. The intake of boy entrants in 1951 was 1,814, more than double the number in 1950.

21. During the year, over 40 per cent. of young men registering for national service asked to serve in the Royal Air Force, but the number opting was very much greater than the available vacancies. At the outset of their period of service, 31,135 national servicemen transferred to regular engagements for periods of three, four and five years. In addition, between April and December, 1951, 2,486 national servicemen transferred to regular engagements during their period of national service.

22. The pay increases, New Trade Structure (with the offer of careers up to age 55), and Re-engagement Bounties, introduced during the latter half of 1950, all contributed to a substantial increase in the numbers of airmen re-engaging for long service during 1951. Although the numbers re-engaging and extending averaged well over 2,000 a quarter during the year, this is still inadequate, and the Re-engagement Bounty scheme, introduced in October, 1950, has been continued for a further year. In addition, an Extension Bounty has been introduced to encourage men on short engagements to serve for 12 years.

23. Although women have had the benefit of new rates of pay and improved conditions of advancement, recruiting for the Women's Royal Air Force remains disappointing.

AUXILIARY AND RESERVE FORCES

24. Three new transport squadrons and more Fighter Control and Radar Reporting Units are being added to the Royal Auxiliary Air Force.

25. Eleven flights in the Royal Air Force Volunteer Reserve were formed at Fighter Command control and reporting stations last year, and three will be formed during 1952. Three reserve flights have also been set up for Movements (Embarkation) duties.

26. A start has been made by certain University Air Squadrons in the provision of training for navigators and fighter controllers as well as for pilots.

27. The Air Training Corps and the Royal Air Force Sections of the Combined Cadet Force have kept up their numbers. Primary gliders are being supplied to the larger Royal Air Force Sections of the Combined Cadet Force, and the supply of dual control gliders to Air Training Corps gliding schools will be increased.

WORKS

28. Greatly increased provision is needed for work on the development of airfields and provision of technical and domestic buildings required to

meet the needs of the expansion programme and to improve war readiness. High priority will continue to be given to the rehabilitation and extension of the radar chain.

29. Much effort is still being devoted to the married quarter building programme. At home, some 4,500 quarters are under construction and about 2,000 will have been completed during 1951-52. Overseas, 400 are under construction and 370 will have been completed during the year. It is hoped to continue the programme at about the present rate and to improve on the rate of completion of houses during the coming year.

SUPPLY

30. Information on the equipment of new squadrons and the re-equipment of existing squadrons is given in paragraphs 5-8 above. Setbacks in production are being experienced.

31. During 1952, four new types of training aircraft will be introduced into squadrons—two jet trainers, the Vampire T.2 and the Canberra T.4, and two piston-engined trainers, the Provost and the Balliol. In addition, the re-equipment of certain training schools with the Varsity, a modern piston-engined aircraft for crew training, will be completed.

32. The production of navigational aids, equipment, armament and ammunition required for the new types of aircraft coming into service will increase. Provision has also been made for the maintenance spares, general stores and ground equipment required for the expanding Force.

METEOROLOGY

33. The weather charts shown in the Television Service of the British Broadcasting Corporation have been improved, and are now transmitted from the new television transmitters at Holme Moss and Sutton Coldfield as well as from London. A supplement to the Daily Weather Report now sets out upper-air observations from a selection of stations overseas under the control of the Meteorological Office.

34. The analysis of upper air charts and the forecasting of upper winds are being extended as a matter of routine to the great heights required for the operation of jet aircraft. The series of charts of the upper winds over the Globe to a height of 40,000 feet published in 1950 is being revised, and a detailed investigation of upper wind and temperature to some 55,000 feet in the region between Middle Europe and the Equator has been started.

35. Special investigations are also taking place in connection with the severe bumpiness which is met by aircraft at high levels and in the absence of cloud. It appears that this phenomenon is closely associated with the high speed air currents which occur at these levels, and frequently exceed 100 knots.

36. Work is also being done, in collaboration with service and civil aviation authorities, on the problem of fog at airfields. This work covers both the practical and scientific aspects of landing aircraft in bad visibility.

DE L'ISLE AND DUDLEY

AIR MINISTRY,
February 19, 1952.

ABSTRACT OF AIR

Vote	Service	ESTIMATES, 1952-53		
		Gross Estimate	Appropriations in aid	Net Estimate
A	Maximum number of officers, airmen and airwomen to be maintained for Air Force service			315,000
1	Pay, etc., of the Air Force	£ 89,770,000	£ 2,520,000	£ 87,250,000
2	Reserve and Auxiliary services ..	1,981,000	1,100	1,979,900
3	Air Ministry	4,012,000	112,000	3,900,000
4	Civilians at outstations	28,050,000	1,930,000	26,120,000
5	Movements	12,330,000	430,000	11,900,000
6	Supplies	72,100,000	5,900,000	66,200,000
7	Aircraft and stores	215,500,000	24,500,000	191,000,000
8	Works and lands	84,240,000	10,800,000	73,440,000
9	Miscellaneous effective services ..	3,590,000	1,460,000	2,130,000
10	Non-effective services	3,870,000	150,000	3,720,000
11	Additional married quarters	5,400,100	5,400,000	100
	Total	£ 520,843,100	£ 53,203,100	£ 467,640,000

(a) Exclusive of Supplementary Estimate of 15,000 (H.C. 90 of 1951-52).
 (b) Exclusive of Supplementary Estimate of £1,800,000 (H.C. 90 of 1951-52).

DE L'ISLE AND DUDLEY
 NIGEL BIRCH

J. C. SLESSOR
 L. N. HOLLINGHURST

NOTE.—The increased Appropriation in Aid arising from "Counterpart Funds" (vide Statement on Defence, paragraphs 4 and 6) are not included above. They were shown in a separate "Revised Abstract" (not reproduced), issued at the same time as the Estimates. The £30,000,000 allotted to the Air Force was all allocated to Vote 7, and reduced the total Estimate by that figure.

Air Ministry,
 February 11, 1952.

ESTIMATES, 1952-53

Estimates, 1951-52		Differences on Net Estimates		Vote
		270,000 (a)	Increase 45,000	A
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease
£ 78,700,000	£ 1,700,000	£ 77,000,000	£ 10,250,000	£ — 1
1,571,000	1,100	1,569,900	410,000	— 2
3,310,000	132,000	3,178,000	722,000	— 3
23,082,000	660,000	22,422,000	3,698,000	— 4
9,300,000	650,000	8,650,000	3,250,000	— 5
44,795,000	4,690,000	40,105,000	26,095,000	— 6
150,790,000	18,000,000	132,790,000	58,210,000	— 7
44,920,000	7,420,000	37,500,000	35,940,000	— 8
2,655,000	1,165,000	1,490,000	640,000	— 9
4,166,000	121,000	4,045,000	—	325,000 10
7,200,100	7,200,000	100	—	— 11
370,489,100	41,739,100	328,750,000 (b)	139,215,000	325,000

Net increase £138,890,000

W. F. DICKSON
R. A. COCHRANE

A. P. M. SANDERS
J. N. BOOTHMAN

J. H. BARNES

BRITISH AND FOREIGN ARMED FORCES

PRINCIPAL OFFICIALS

On April 1, 1952

GREAT BRITAIN

Minister of Defence: The Rt. Hon. The Viscount Alexander, K.G., G.C.B., G.C.M.G., C.S.I., D.S.O., M.C.
Chief Staff Officer: Air Marshall Sir William Elliot, K.B.E., C.B., D.F.C.

Board of Admiralty

First Lord: The Rt. Hon. J. P. L. Thomas, M.P.
First Sea Lord and Chief of Naval Staff: Admiral Sir Rhoderick R. McGrigor, G.C.B., D.S.O.
Second Sea Lord and Chief of Naval Personnel: Vice-Admiral Sir Alexander C. G. Madden, K.C.B., C.B.E.
Third Sea Lord and Controller: Vice-Admiral Sir Michael M. Denny, K.C.B., C.B.E., D.S.O.
Fourth Sea Lord and Chief of Supplies and Transport: Rear-Admiral S. M. Raw, C.B., C.B.E.
Fifth Sea Lord and Deputy Chief of Naval Staff (Air): Vice-Admiral E. W. Anstice, C.B.
Vice-Chief of Naval Staff: Vice-Admiral G. Grantham, C.B., C.B.E., D.S.O.
Assistant Chief of Naval Staff: Rear-Admiral E. M. Evans-Lombe, C.B.
Civil Lord: Commander A. H. P. Noble, D.S.O., D.S.C., M.P.
Parliamentary and Financial Secretary: K. S. D. W. Digby, Esq., M.P.
Permanent Secretary: Sir John G. Lang, K.C.B.

Army Council

President, Secretary of State for War: The Rt. Hon. Anthony Head, C.B.E., M.C., M.P.
Vice-President, Parliamentary Under-Secretary of State for War, and Financial Secretary of the War Office: J. R. H. Hutchison, Esq., D.S.O., M.P.
First Military Member, Chief of the Imperial General Staff: Field Marshal Sir William J. Slim, G.C.B., G.B.E., D.S.O., M.C.
Second Military Member, Adjutant General to the Forces: General Sir James S. Steele, K.C.B., K.B.E., D.S.O., M.C., LL.D.
Third Military Member, Quarter-Master General to the Forces: General Sir Sydney C. Kirkman, K.C.B., K.B.E., M.C.
Fourth Military Member, Vice Chief of the Imperial General Staff: Lieutenant-General Sir Nevil C. D. Brownjohn, C.B., C.M.G., O.B.E., M.C.
Fifth Military Member, Deputy Chief of the Imperial General Staff: Lieutenant-General Sir John F. M. Whitley, K.C.B., C.B.E., M.C.
Permanent Under-Secretary of State for War: Sir George W. Turner, K.C.B., K.B.E.

Air Council

Secretary of State for Air and President of the Air Council: The Rt. Hon. The Lord de L'Isle and Dudley, V.C.
Parliamentary Under-Secretary of State for Air and Vice-President of the Air Council: The Hon. George Ward, M.P.
Chief of the Air Staff: Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C.
Air Member for Personnel: Air Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C.
Air Member for Supply and Organisation: Air Marshal Sir William F. Dickson, K.B.E., C.B., D.S.O., A.F.C.
**Vice-Chief of the Air Staff:* Air Chief Marshal The Hon. Sir Ralph A. Cochrane, K.C.B., K.B.E., A.F.C., A.D.C.
**Deputy Chief of Air Staff:* Air Chief Marshal Sir John W. Baker, K.C.B., M.C., D.F.C.
**Controller Supplies (Air):* Air Marshal J. N. Boothman, C.B., D.F.C., A.F.C.
(Ministry of Supply)
Permanent Under-Secretary of State for Air: Sir James H. Barnes, K.C.B., K.B.E.

• Additional Member.

PRINCIPAL OFFICIALS OF ARMED FORCES
 On April 1, 1952
COMMONWEALTH

Country	Minister of Defence	Minister for Navy	C.O.S.	Minister for Army	C.O.S.	Minister for Air	C.O.S.
Australia ..	P. A. M. McBride ..	W. McMahon ..	Vice-Admiral Sir John Collins R.A.N.	J. Francis ..	Lieut.-General S. F. Rowell ..	W. McMahon ..	Air Marshal J. D. I. Hardman, R.A.F.
Canada ..	.. B. Claxton ..	—	Vice-Admiral E. R. Maingay R.C.N.	—	Lieut. - General J. G. Simonds ..	—	Air Marshal W. A. Curtis R.C.A.F. —
428 Ceylon ..	.. D. Senanayake† ..	—	Captain J. R. S. Brown ..	—	Brig. The Earl of Caithness ..	—	Air Marshal G. E. Gibbs, R.A.F.
India ..	.. Sardar Baldev Singh ..	—	Vice-Admiral C. T. M. Pizay R.N.	—	General K. M. Cariappa ..	—	Air Vice-Marshal D. V. Carnegie, R.A.F.
New Zealand ..	.. T. L. McDonald ..	—	Commodore F.A. Ballance, R.N.	—	Major - General W. G. Gentry ..	—	Air Vice-Marshal L. W. R. Cannon, R.A.F.
Pakistan ..	.. Al Haj Khwaja Nazimuddin† ..	—	Rear-Admiral J. W. Jefford, R.N.	—	Lieut. - General R. C. McCay ..	—	Brigadier H. G. Willmott†
South Africa ..	.. F. C. Erasmus ..	—	Brigadier P. de Wal ..	—	Lieut. - General L. C. du Toit ..	—	

† And Prime Minister.

‡ Director-General, South African Air Force.

PRINCIPAL OFFICIALS OF ARMED FORCES

On April 1, 1952

U.S.A. AND NORTH ATLANTIC TREATY COUNTRIES OF WESTERN EUROPE

Country	Minister of Defence	Minister for Navy	C.O.S.	Minister for Army	C.O.S.	Minister for Air	C.O.S.
U.S.A. ..	R. A. Lovett ..	D. Kimbell	Admiral W. M. Fechteler	F. Pace	General J. Lawton Collins	Thomas K. Finletter	General Hoyt Vandenberg
Belgium ..	Colonel de Gref ..	Commodore G. Timmermans	Commander L. J. Robins	—	Lieut. - General E. Baele	—	General Vandenberg
Denmark ..	M. Harald Petersen ..	Vice-Admiral A. H. Vedel*	Rear-Admiral H. A. Nyholm	—	Major - General E. C. T. Moller	—	Major Aviateur Lucien Leboute
France ..	M. Rene Pleven ..	M. Gavini	Admiral H. L. G. M. Nomy	M. Paul Ramadier	General de Corps d'Armee C. Blanc	M. Andre Maroselli	General d'Armee Aerienne C. F. Lecheres
Italy ..	Sr. Randolphi ..	—	Admiral Emilio Perreri	—	Lieut. - General E. Cappa	—	Lieut. - General U. Urbani
Luxembourg ..	M. Joseph Bech ..	—	—	Colonel Jacoby	Colonel A. Jacoby	—	—
Netherlands ..	Mr. C. Staff ..	Rear-Admiral C. W. Moorman	Vice-Admiral A. de Bouij	—	Lieut. - General B. R. P. F. Haselman	—	Lieut. - General I. A. Aler
Norway ..	M. Nils Longhelle ..	Vice-Admiral S. V. Storheill, D.S.C.*	Commodore R. K. Andresen	—	Lieut. - General W. Hansteen†	—	Lieut. - General F. Lambrechts†
Portugal ..	Lt. Col. Fernandes dos Santos Costa ..	Rear-Admiral A. Tomaz	Vice - Admiral Oliveira Pinto	General A. do A. A. Pinto	General J. de Rodriguez	—	—

* C.in-C. of Navy. † C-in-C. Army. ‡ C.-in-C. Air Force.

HEADS OF BRITISH SERVICES MISSION IN FOREIGN COUNTRIES

On April 1, 1952

UNITED NATIONS. MILITARY STAFF SERVICE

Major-General W. A. Dimoline (*Chairman*)
Captain R. G. Mackay, R.N.
Group Captain A. M. Montague-Smith

BRITISH JOINT SERVICES MISSION. WASHINGTON

Air Chief Marshal Sir William Elliott (*Chairman*)
Admiral The Hon. Sir C. E. Douglas-Pennant.
Major-General W. H. Stratton.
Air Vice-Marshal J. D. Breakey.

BURMA

Air Commodore J. Ward
Commander R. S. Christian-Edwards
Lieutenant-Colonel H. C. Baker-Baker

EIRE

Lieutenant-Colonel J. R. Britten.

GREECE

Rear-Admiral P. S. Smith
Group Captain D. G. Lewis.

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